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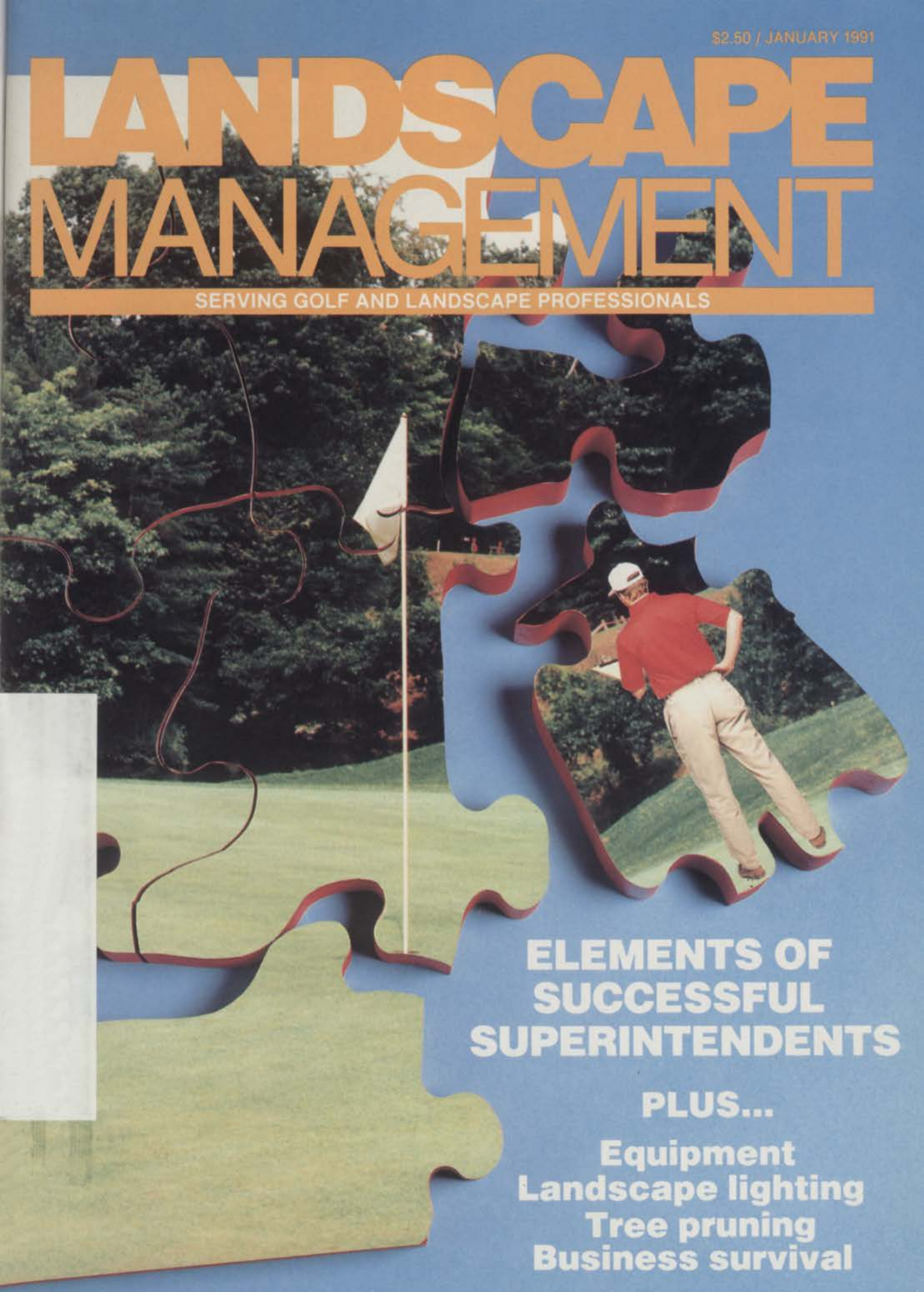

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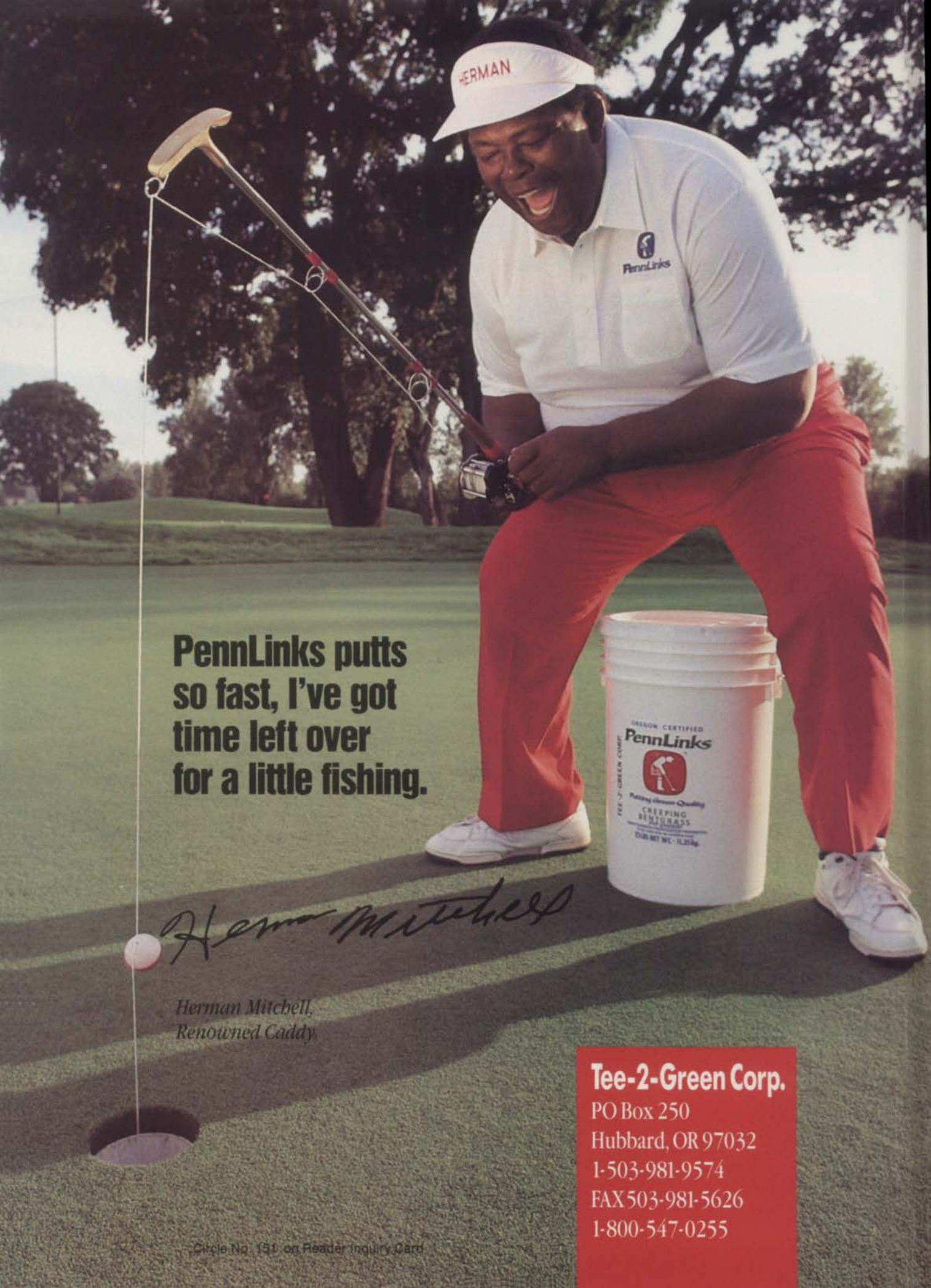

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JANUARY 1991, VOLUME 30, NUMBER 1

LANDSCAPE MANAGEMENT®

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LANDSCAPE MANAGEMENT (ISSN 0894-1254) is published monthly by Edgell Communications, Inc. Corporate and Editorial offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Advertising Offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130 and 3475 Lenox Road, N.E., Suite 665, Atlanta, Georgia 30326. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $25 per year in the United States: $50 per year in Canada. All other countries: $100 per year. Current issue single copies (pre-paid only): $2.50 in the U.S.; $5.00 in Canada; elsewhere $10.00; add $3.50 per order for shipping and handling. Back issues, if available, $10; add $3.50 per order for shipping and handling (pre-paid orders only). Office of publication: Edgell Communications, Inc., 1 East First Street, Duluth, Minnesota 55802. Second class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright© 1991 by Edgell Communications, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher.

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AS I SEE IT...

The turfgrass industry mourns

Business is up. Profits are holding steady. 1990 has been a good year for the turf and landscape industry.

Or has it?

News comes this morning, as we prepare to send this issue to the printer, that Dr. Fred Grau passed away last night (see "Green Industry News"). Barely a month ago, Harry Gill was taken from us.

The word "great" is not one to be taken lightly. But when describing the contributions Fred and Harry made to this industry, no word other than "great" can be used. For they imparted not just knowledge, but they gave of *themselves*, each in his own unique way, each for many, many years.

Neither could sit back and watch life pass before him. In their later years, both disliked not being able to get their fingernails dirty every day, Harry at Milwaukee County Stadium, Fred at whatever turf research plots were handy. Harry kept active even after a multiple heart bypass. Fred, once threatened by leg amputation, witnessed numerous turf shows from his wheelchair.

Harry was the consummate team player, forever offering his assistance to any athletic field manager who might ask. He spent countless hours speaking to others on the phone, giving informative—usually hilarious—speeches at seminars, sitting at the bar swilling over the seemingly endless tales that enthralled whoever might be listening. (And he always drew a big crowd.)

Fred was a far quieter countenance, cerebral, at one with nature. The man dedicated his whole life to the advancement of turfgrass science, and he enjoyed it. My, how he enjoyed it!

"The big window at my desk gives me a clear view of my trouble-free lawn and the healthy plantings," he once wrote. "The brilliance of the grass is remarkable. Last night, a white frost covered all. Today, it's 45 degrees, the frost is gone, but the grass color is still striking. I get inspiration from this view."

Harry claimed his degree was from the College of Hard Knocks; Fred earned a Ph.D. from the University of Maryland. So while Harry was a popular speaker, Fred was a prolific writer, sharing with this office many of what he called his "Musings." Yet much of their material could not be published in this magazine, Harry's because it was too ribald, Fred's because it was too philosophical.

Fred once wrote—after this magazine had made a modest donation to his "baby," the National Sports Turf Council—that he was proud to be our friend.

He had it all wrong. It was the turfgrass industry that was proud to have such friends and benefactors as the kindly Fred Grau and the fascinating Harry Gill.

The industry mourns their passing.

Jerry Roche

Jerry Roche, editor-in-chief

LM

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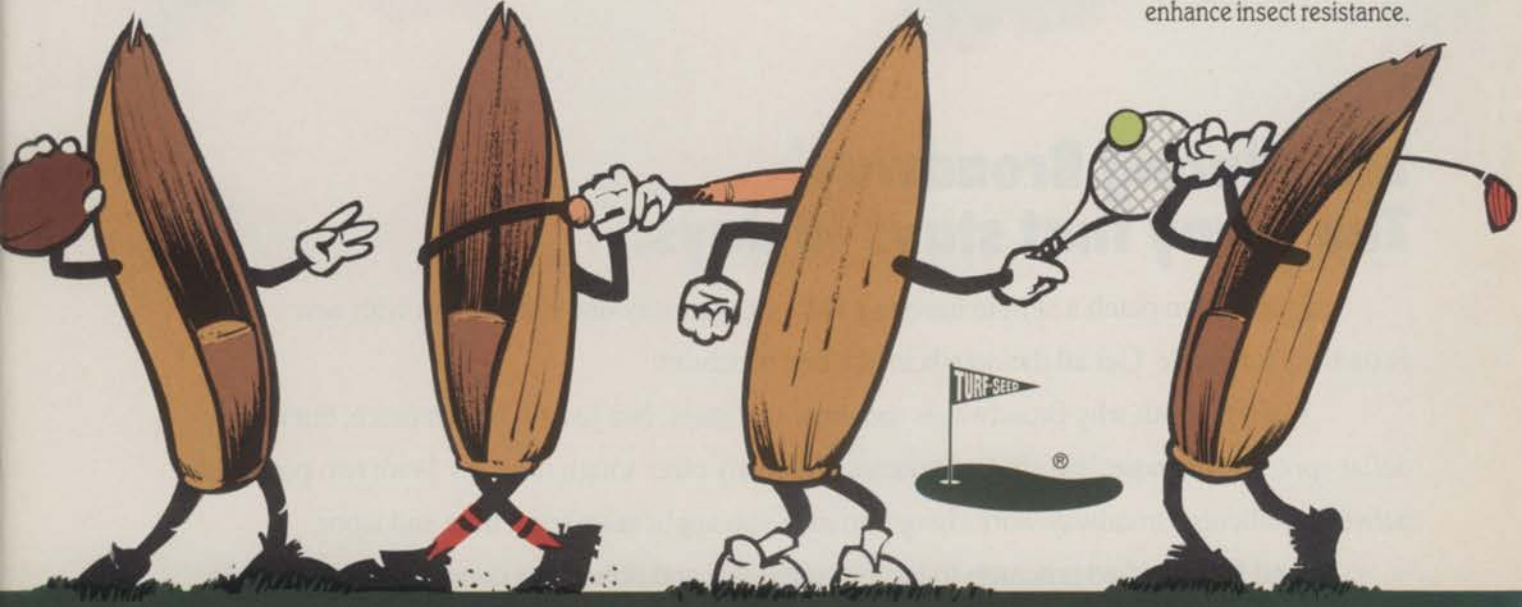

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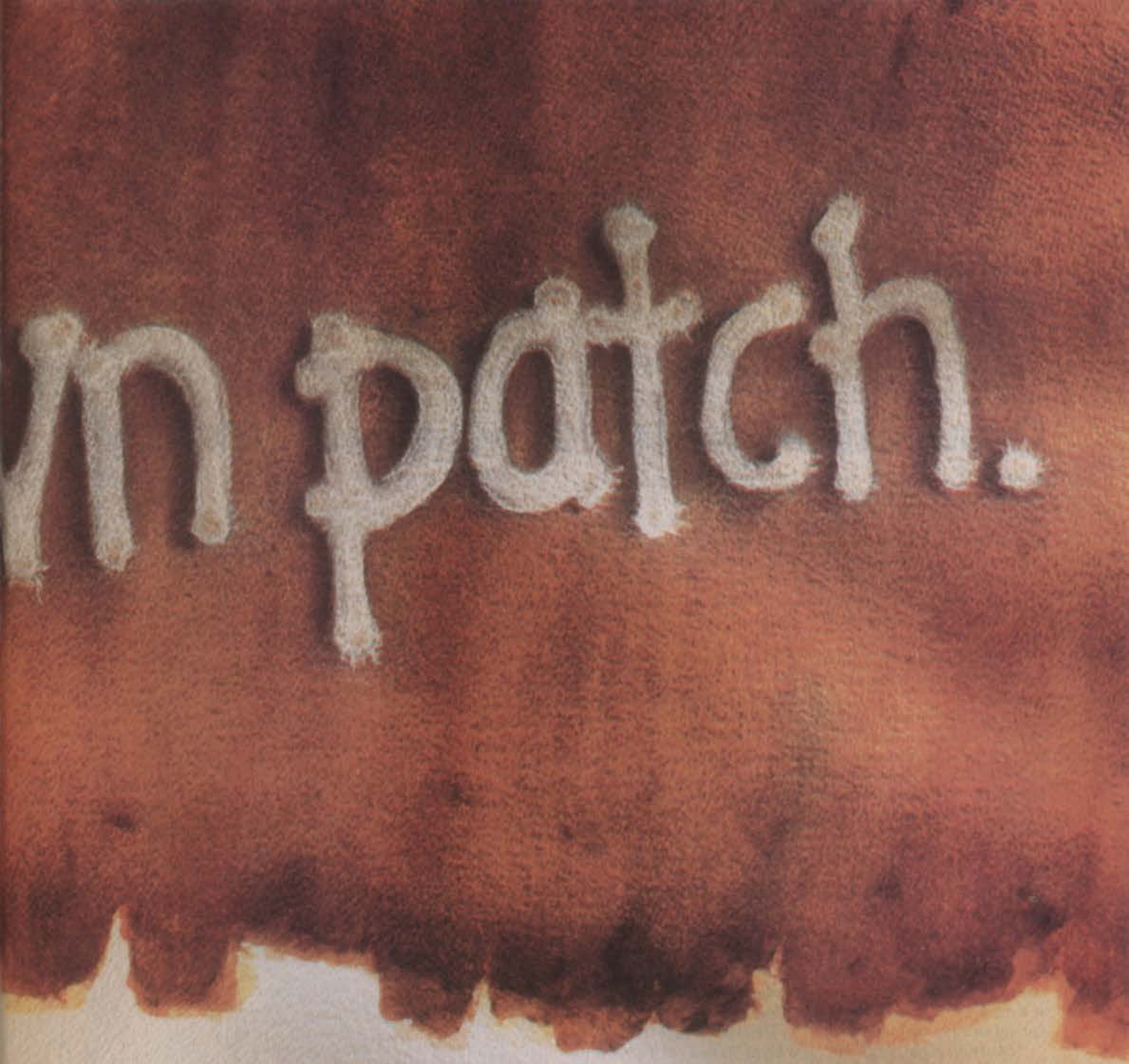

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GREEN INDUSTRY NEWS

JANUARY 1991, VOLUME 30, NUMBER 1

LANDSCAPE MANAGEMENT

PEOPLE

Grau left his heart to the green industry

CHEVERLY, Md. — Dr. Fred Grau closed all of his letters with, "Sincerely yours, for better turf."

In a life devoted to the research and development of improved turf species, his accomplishments and discoveries were many.

Grau, 88, died here Dec. 1, 1990 of congenstive heart failure.

Born in Bennington, Neb., Grau earned his Ph.D. from the University of Maryland in 1935. In Pennsylvania, he was the nation's first extension turf specialist.

Perhaps Grau's most enduring accomplishment—and what he himself called "the discovery of a lifetime"—was finding crownvetch along Rt. 222 in Berks County, Pa. Grau later remembered standing at a fork in the road, wondering which way to turn.

"I turned right, and discovered a cinder-and-shale pile covered with beautiful pink blossoms. That was the crownvetch industry in its infancy. Had I turned left, I would never have stumbled upon it."

Grau and his first wife Anne developed and promoted Penngift Crownvetch. Today, it's Pennsylvania's official beautification and conservation plant, and is used along roadsides worldwide.

A time of discovery

Grau's timely presence during the most important period in turf science history cannot be overstated. His contemporaries in the early 1930s included O.J Noer, H.B. Musser and Lawrence Dickenson. Grau was considered to be the last remaining research giant from among the earliest turf industry pioneers.

Grau's enthusiasm for Alta and Kentucky-31 led to the later development of the fine leaf tall fescues. In 1950, he played an active role in the research and release of Merion Kentucky bluegrass and Meyer zoysiagrass.

Grau and Musser collaborated to develop Penncross bentgrass in 1950-51.

Friend to students

As director of the USGA Green Section, Grau established fellowships that enabled more than a few research students to earn advanced degrees.

Dr. James Watson—for whom Grau obtained a grant in 1946 for Ph.D. studies at Penn State—said that Grau never lost interest in his work.

"He was dedicated to the improvement of turfgrass throughout his adult life," said Watson, "and he continually sought new avenues to enhance the practical and scientific aspects of the industry. No question about it, he loved the industry."

Designed equipment

Grau also found ways to improve turf equipment. In 1938, he and Dr. C.N. Keyser built the first hydroseeder for use on the Pennsylvania turnpike.

FRED V. GRAU
1902-1990

As a consultant to West Point Products in Pennsylvania, Grau worked with Tom Mascaro to develop and patent the "Aerifier," a spoon-type turf cultivator.

"He was the most knowledgeable man I ever met in my whole life," recalled Mascaro. "He was a brilliant speaker and lecturer who could inspire many people."

Grau and retired superintendent Eb Steinecker were friends for 60 years. Steinecker visited Grau the day before he died.

"He could hardly talk, he had such a bad cold," said Steinecker. "So I said, 'Let me do the talking for once.' He said, 'Let's keep in touch; I have so much to tell you...' He was always clicking."

continued on page 13

SHOWS

Superintendents to honor three

LAWRENCE, Kans. - Dr. Noel Jackson, Dr. Eliot Roberts and W. Bruce Matthews will be honored by the GCSAA next month with 1991 Distinguished Service Awards.

Jackson is plant pathologist at the University of Rhode Island; Roberts executive director of The Lawn Institute and Matthews a course architect.

The trio will be presented its awards at the opening session of the 62nd International Golf Course Conference and Show in Las Vegas, Nev., Feb. 5-12.

Jackson's research work and fungicide evaluations have contributed a wealth of information on turf patch diseases. Roberts, who is retiring soon, has spent 28 years as a turf management teacher, researcher and administrators. Matthews has been a member of the GCSAA for 56 years.

Many of the 40 educational sessions scheduled at the conference will stress the superintendent's environmental protector role.

New for this year's conference is an in-depth Environmental Management Program (EMP) developed by the GCSAA that allows superintendents an opportunity to gain specialized instruction in environmental areas.

Three EMP seminars will be initiated this year: "Protection of Water Resources," "Scouting, Sampling and Monitoring Golf Course Pests" and "Underground Storage Tank Selection and Installation."

More than 13,000 turf professionals are expected to attend the show, the biggest in the turf and landscape industry. For more information on attending, call (800) 472-7878 or (913) 841-2240. □

Dr. Noel Jackson

Dr. Eliot Roberts

GOLF

California ranks first among states ripe for development

JUPITER, Fla. — More Californians may be teeing up the little pill, based on a recent National Golf Foundation survey which shows that state offers the most opportunity for golf course development.

Nine California counties are mentioned as being ripe for development, out of a 50-county/20-state total.

"This list is only a beginning, not a conclusion," says NGF President Joe Beditz, "but it names the first places I'd look to invest my own money in the golf course business."

Next in line after California are Florida, Georgia and Virginia, each with five counties listed.

According to the NGF, the list reflects expanded methods of identifying more exactly where courses are likely to be needed, based on income and age demographics, population density, growth and migration patterns. Those factors were compared with golf supply—existing facilities or those in planning or under construction.

Rick Norton, in charge of NGF Consulting, says opportunity is one thing, actual development another.

"Actual investment decisions," notes Norton, "would require additional study of specific market conditions, site constraints, environmental permitting, land costs, availability of financing and other potential limiting factors." □

GOVERNMENT

Legislators admit turfgrass benefits

WASHINGTON — Congress has finally admitted that turfgrass is beneficial to the environment.

According to the 1990 Farm Bill, "tree plantings and groundcovers such as turfgrass sod can aid in reducing carbon dioxide emissions, mitigating the heat island effect, and reducing energy consumption..."

The American Sod Producers Association believes its own lobbying efforts were instrumental in the statement.

"ASPA's successful efforts in providing direct scientific evidence to demonstrate that turfgrass can be as effective as trees in environmental improvement programs will continue," the organization says.

"There exists very solid science," says ASPA executive director Doug Fender, "to support the environmental benefits of turf. We gave information based on studies by Tom Watschke, Harry Niemczyk, Marty Petrovic and James Beard."

Fender said congressmen complimented ASPA for "turning lights on in people's minds."

The Farm Bill provides nearly $21 million for urban and community tree and turf planting and improvements in fiscal 1991. □

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GOLF

Brede devises speed formula for sloped golf course greens

POST FALLS, Idaho — Dr. Doug Brede of Jacklin Seed Co. has apparently devised an accurate formula for easily computing stimpmeter ratings for sloped golf course greens.

"The mathematical equation takes out the effect of the slope without being complicated," Brede tells LANDSCAPE MANAGEMENT. "It's a very simple formula that a golf course superintendent can use with a calculator that allows him to read particular spots of a green."

In the November/December issue of USGA Green Section Record, Brede reveals the formula. Step one is to take two stimpmeter readings, one up the slope (S_u) and one down the slope (S_d). Here is the formula:

$$\frac{2 \times S_u \times S_d}{S_u + S_d}$$

The USGA likes the idea.

Dr. Doug Brede

"We plan to do a major rewrite of the stimpmeter instruction brochure this January," says USGA Green Section director Jim Snow. "It's the first major rewrite since the stimpmeter was introduced some 13 years ago. We plan to incorporate this new formula into the revised stimpmeter recommendations." □

EVENTS

JANUARY

21-23: Michigan Turfgrass Conference, Clarion Hotel, Lansing, Mich. Contact: Michael Saffel, 584G Plant & Soil Science Bldg., Michigan State University, E. Lansing, MI 48824; (517) 353-9022.

22-24: Inland Northwest Turf & Landscape Conference and Trade Show. Contact: Jones & Associates, Park Center, Suite 200, N. 908 Howard St., Spokane, WA 99201-2261; (509) 327-5904.

23-24: Northern California Turf & Landscape Exposition, Santa Clara Convention Center. Contact: 425 Oak St., Brentwood, CA 94513; (415) 516-0146.

23-25: American Sod Producers Assn. Midwinter Conference and Exposition, San Antonio (Tex.) Hyatt Regency. Contact: ASPA 1855-A Hicks Rd., Rolling Meadows, IL 60008; (708) 705-9898.

31: Southern California Spring Horticultural Trade Show, Los Angeles County Fairgrounds. Contact: Richard Staples, 3136 Root Ave., Carmichael, CA 95608; (916) 488-6434.

FEBRUARY

5-12: International Golf Course Conference, Las Vegas (Nev.) Convention Center. Contact: GCSAA, 1617 St. Andrews Dr., Lawrence, KS 66047-7878; (913) 841-2240 or (800) 472-7878.

14: Connecticut Turf and Landscape Conference, Hartford (Conn.) Civic Center. Contact: Elizabeth Maisano, P.O. Box 876, Bethel, CT 06801; (203) 791-8615. □

'Sincerely yours, for better turf...'

GRAU *from page 11*

In 1968, Grau organized the Musser International Turfgrass Foundation to develop qualified leaders in turfgrass science and promote safer sports turf. The National Sports Turf Council followed in 1986.

Stricken by polio in later years, Grau's pace was slowed. However, his enthusiasm in turf research remained vibrant.

Grau was a prolific and opinionated writer. Whether in his "Musings" and "Gleanings" columns, "Grau's Q&A" (which he wrote for 30 years for *Golfdom* magazine) or his informal, handwritten notes, Grau provided his fellow turf professionals with direct, honest observations.

A memorial service was held on Dec. 8.

—*Terry McIver*□

LETTERS

Remembering Fred Grau

To the editor:

In the summer of 1986, as the managing editor of LANDSCAPE MANAGEMENT, I traveled to Fred Grau's home in Maryland to talk turf. When he opened the door, I saw a large, elderly man with failing eyesight, sitting on a cart that seemed almost an extension of himself.

He looked up with a big smile and asked, "What would you like for breakfast?" But before I could answer, he took out the eggs (farm fresh, brown ones) and began scrambling. The eggs...and my mind. Fred, after all, was always coming up with new ideas and inventions, though he's best known for crownvetch.

My first image of him as "elderly" was completely wrong. He was perhaps the most youthful, energetic person I have ever met.

I followed Fred down the street as he whizzed ahead on his cart, eagerly telling me about his neighbors with the brown lawn. Later we had homemade ice cream at the University of Maryland's dairy farm. The ice cream tasted rich that steamy day. But the richest experience was just getting to know Fred Grau.

He sent me home with stacks of his writing, and ideas on improving the safety of athletic fields and—most importantly—educating field managers.

Although I saw Fred many other times at trade shows, it is that day I remember most. The athletic turf articles were published with a special thanks to Fred. And the editorial I wrote then, about injured athletes, was called "Images of Grief."

"Grief" is a word Fred would give little credence. So when remembering Fred Grau, remember instead the images of life.

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Disposal of grass clippings may soon be illegal.

It's true. The landscape maintenance profession has come under the scrutiny of lawmakers and environmentalists. Several states have passed laws against dumping grass in the local landfill and by 1995 nearly all states will have some form of legislation governing the disposal of lawn wastes.

*The only **complete** maintenance system in its class—equip your Hustler with the 8-bushel BAC-PAC and side-mounted edger for fast clean-up and a professional finish.*

Shred the evidence

Don't be left holding the bag. Now you can shred your clippings **as you mow** with the Hustler Turbo Shredder™ rotary mower from Excel. The Turbo Shredder reduces clippings to tiny particles which fall quickly, harmlessly, (and legally) back to the soil surface. No one will know you left them behind to decompose naturally.

The Case for Shredding

When you shred clippings, you help the turf recover valuable nutrients that would ordinarily be hauled to the landfill. University studies have shown that leaving the clippings can eliminate one fertilizer application per year. You also save the cost of the labor to put it on.

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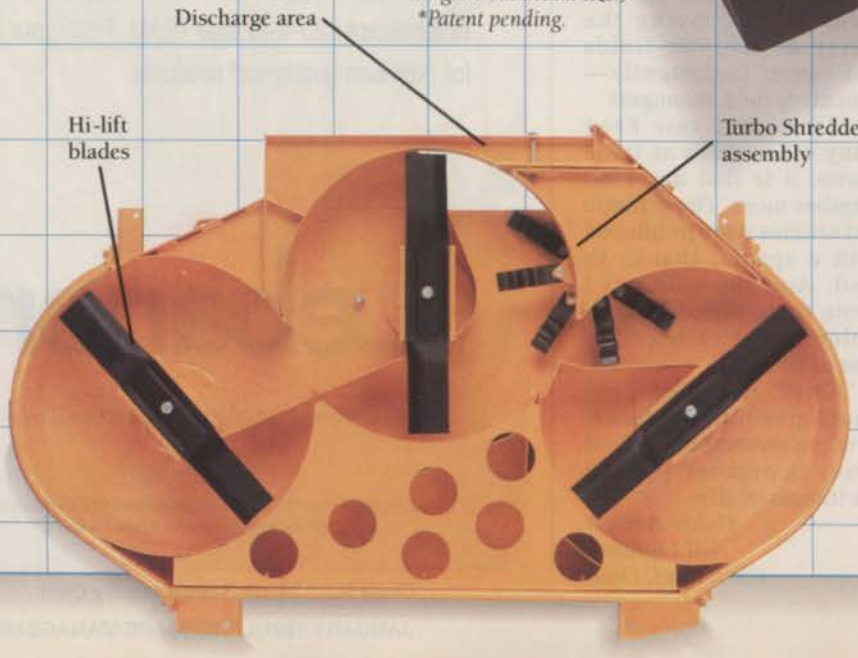

Excel's Secret Weapon against grass bags—Hi-lift blades cut the grass and direct the clippings into the Turbo Shredder assembly where they are re-cut again and again.

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The Hustler Turbo Shredder is a **complete** turf maintenance system. A single operator can mow, edge and clean up in less time than it takes a two man crew with 48" walk-behinds and a power edger. The Hustler 251K and 260K offer operator comfort features like a high

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The Hustler Turbo Shredder deck, in 51″ or 60″ cutting widths, is the innovative answer to your clippings disposal problems.

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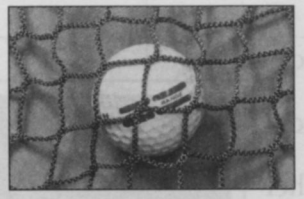

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NEWS BRIEFS

FROM THE HILL... Congress recently amended the Small Business Act. The Small Business Administration now has the authority to grant money to local governments for the purpose of contracting with small businesses to plant trees on land owned or controlled by the state or local governments. To apply for a grant, call (202) 643-6605.

THE SUBJECT WAS BENTGRASS...at the recent Wisconsin Golf Turf Symposium in Milwaukee. **Dr. Joe Duich**, speaking on bentgrass research in Pennsylvania, advised seed buyers to make careful note of seed lot numbers, and retain all records, "to insure they get what they pay for." **Kevin Dushane**, superintendent at the Bloomfield Hills Country Club in Union Lake, Mich., said that, when it comes to bentgrass fairways, "players—principally lower handicap players—would like to have a fairway lie where the ball sits up on the turf. Mowing at 1/2-inch with a good stand of bentgrass can deliver that playing condition."

MAKING PLANS... The Associated Landscape Contractors of America's recent long range plan, "Visions '95," details numerous five-year goals. "By 1995," the report reads, "(ALCA) will be viewed as a spokesperson for the industry." Goals:

- to be strongly influential in curriculum development at institutions of higher learning,
- to be a clearinghouse for legislative and environmental updates.
- to provide guidance and information regarding green industry questions.
- to be a "force for research and development."

HORSE TURF... Southern Turf Nurseries of Norcross, Ga., has signed an agreement with Fibresand Ltd. of Mansfield, England, to be the first American company to sell and install the British firm's formulated surface for equestrian sports. Fibresand is described as a clean, free draining silica sand, reinforced with synthetic fibers. According to Southern Turf, the formula provides a forgiving yet consistent surface when under load from horses' hooves, and can be installed indoors or outdoors.

AKA... Mycogen Corp. has changed the name and logo for several of the products it's licensed from Safer Inc. Safer Insecticide Concentrate is now M-Pede insecticide, and Moss & Algae Killer now carries the name DeMoss moss and algicide. SharpShooter herbicide retains its name. All products display the Mycogen "sunburst" logo.

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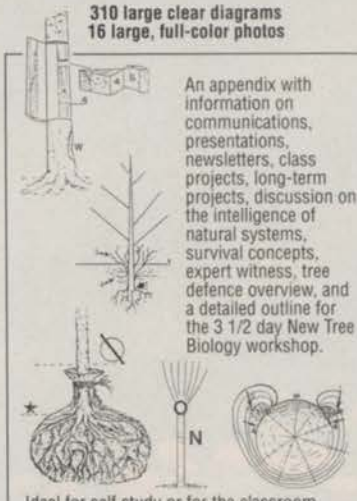

An appendix with information on communications, presentations, newsletters, class projects, long-term projects, discussion on the intelligence of natural systems, survival concepts, expert witness, tree defence overview, and a detailed outline for the 3 1/2 day New Tree Biology workshop.

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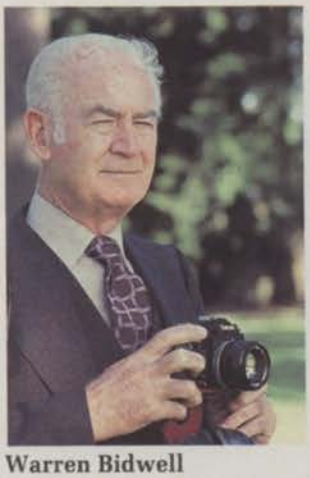
PEOPLE

Semi-retirement suits former super Bidwell



Warren Bidwell

Semi-retirement has been kind to Warren Bidwell, one of the true "legends" of the turf industry. Bidwell checkerboards the world, singing the praises of bentgrasses in general and the "Penn" varieties in particular since his retirement from golf course superintendent-ing 10 years ago.

"The greatest thing to happen to the golf industry is the use of bentgrass for greens farther south all the time," Bidwell observes. "However, if a superintendent in the South is foolish enough to overfertilize bentgrass greens, he (or she) *will* have some problems."

Bidwell—the deliberate, opinionated ex-superintendent at Congressional Country Club in the Washington, D.C. area—never formally studied turf.

"I'm a non-college person," he says. "Short course to short course is the closest I've been to academia. But

continued on page 22

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Finally, A High Ca Doesn't Handle L

For too long, high-capacity mowers have left a lot to be desired. But now all that has changed. Presenting the revolutionary new Groundsmaster® 580-D with an 80 hp turbo-diesel engine. The first large-scale rotary mower that combines the productivity of a 16-foot machine with the handling ease of a smaller mower.

Operating the 580-D is incredibly easy. Only Toro provides an adjustable tilt steering wheel and column. All controls are at the operator's fingertips, even cruise control.

Transport is easy too. An exclusive rotating hinge lowers the outboard cutting units behind the operator for a clear view to the side and rear. A balanced design allows you a stable 20 mph transport speed because the weight of the outboard cutting units is rotated to the rear.

Digital readouts display vital engine/machine functions at the touch of a button.

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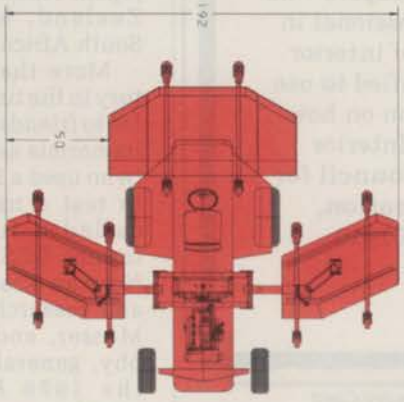
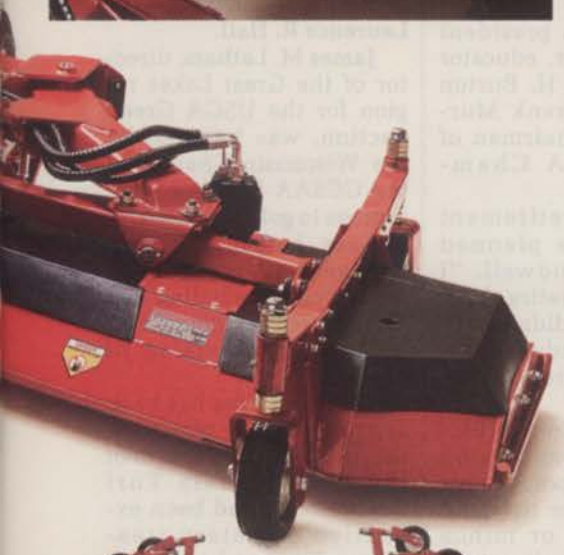
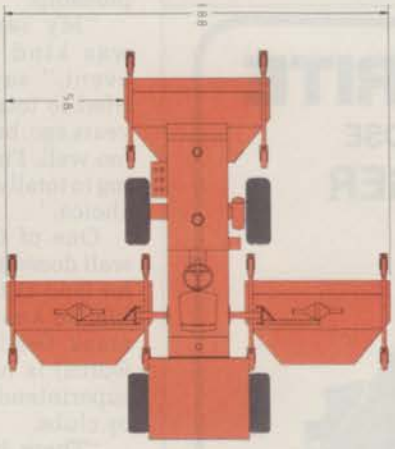
pacity Mower That ike A School Bus.

Toro's outboard cutting units also include an exclusive break-away protection feature. Should the operator misjudge distance, the wings will pivot away from the object that has been hit.



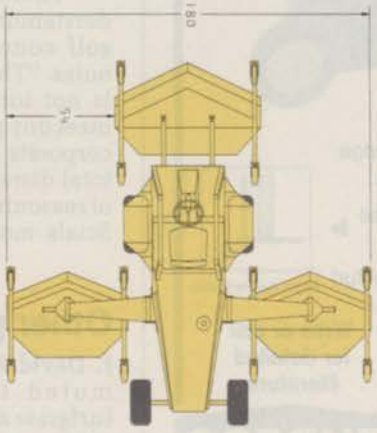
The 580-D's wide stance and short wheelbase give it maneuverability and stability. A short 76" wheelbase lets you turn an 18" uncut circle without braking. And Toro's exclusive swept-forward wing design keeps the tips of the outboard cutting units in line with the front drive wheels improving operator control and visibility.





For even more versatility, the 580-D includes these accessories: an 8-foot front broom attachment, a roll over protection system, a canopy, a cab and a road light package.

If you've been sacrificing ease of operation for high capacity, it's time you saw the revolutionary machine that gives you both: the new Groundsmaster 580-D from Toro. Call your local Toro distributor to see the Groundsmaster 580-D or contact Toro at the address below. You'll see firsthand how productive and versatile large-scale turf mowing can be.



Another Toro exclusive allows you to raise one or both of the outboard cutting units inside the traction unit width. The 580-D can then trim between objects less than 8 feet apart with the 92" Triflex® cutting unit.

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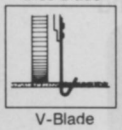

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◀ "V" Blade for removing a strip of turf along a sidewalk.

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TURFCO

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PEOPLE *from page 18*

most of the superintendents today are college-educated young people, which is great for the industry. I saw that trend start 15 to 20 years ago."

Bidwell, whose father was a cemetery manager, began formally working in the green industry way back in the mid-1930s with the Fort Mitchell (Ky.) Club.

Since signing to promote Tee-2-Green grasses in 1973, he has traveled to Japan, Australia and New Zealand, Morocco and South Africa.

More than half-a-century in the turf business has led to friendships with such immortals as Tom Mascaro (who used a Bidwell course to test a new invention called a turf aerator), former GCSAA president Norman Kramer, educator and researcher H. Burton Musser, and Frank Murphy, general chairman of the 1976 PGA Championship.

"My semi-retirement was kind of a planned event," says Bidwell. "I tried to totally retire three years ago, but it didn't work too well. I'm gradually trying to totally retire again, by choice."

One of the trends Bidwell doesn't especially care for (and at this point in his life, he knows he need not mask feelings or mince words) is how golf course superintendents are treated by clubs.

"There is a lack of understanding on the part of golf course officials," he notes. "The superintendent is not totally prepared to meet *any* problem. This is a corporate approach to life: total disregard for any type of reasoning. Golf course officials must be educated."

—Jerry Roche

Other people:

J. David Fischer was promoted to director of turfgrass and governmental sales and marketing for Pennington Seed, and **Russell Nicholson** was promoted to turfgrass agronomist. Fischer will be responsible for marketing the company's growing line of specialty turfgrasses. Nicholson will be responsible for support and consultation to Pennington turfgrass customers.

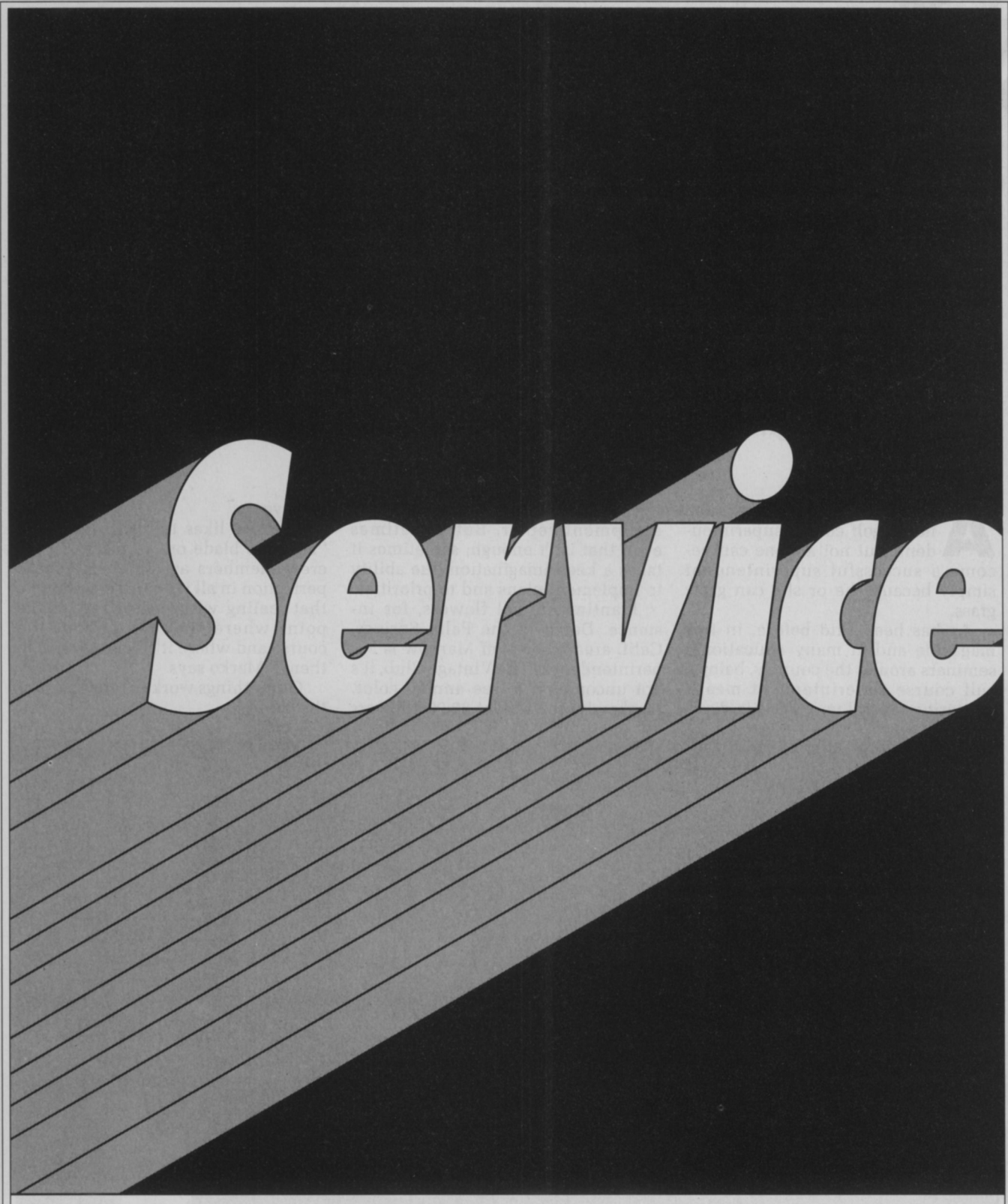
Donald J. Floyd is new research agronomist for Pickseed West. He holds a master's degree in agriculture from Oregon State University. Floyd will supervise Pickseed West's Oak Knoll Research Farm, where an extensive collection of promising breeding material is on hand.

New officers for the American Society of Consulting Arborists are: president **Kenneth D. Meyer**, president-elect **John M. McNeary**, vice president **John S. Miller**, secretary-treasurer **Sam Knapp** and immediate past president **Laurence R. Hall**.

James M. Latham, director of the Great Lakes region for the USGA Green Section, was honored by the Wisconsin Chapter of the GCSAA for his contributions to golf course maintenance. Latham has been involved with the industry for 30 years, including that as marketing manager at Milorganite Division of MMSD.

Christine King has been appointed to the new position of executive director of the Pennsylvania Turf Council. She had been executive secretary-treasurer. She has been with the organization for 13 years.

The late **Don A. Rossi** and the late **Davis Love Jr.** have been named winners of the National Golf Foundation's 1990 Herb Graffis Award and Joe Graffis Award, respectively. The former is for preserving the spirit of golf, the latter for the educational advancement of the game. Rossi was executive director of the NGF from 1970 to 1983, then was owner of his own golf development firm. Love, who competed on the PGA Tour from 1958 to 1973, spent 13 years with instructional schools, writing 35 major educational articles. □



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COVER STORY

ELEMENTS OF SUCCESSFUL SUPERINTENDENTS

It's the little things that separate a good golf course from a great one, and a good superintendent from a great one. Here are some tips, as seen through the eyes of our country's more astute superintendents.

by Jerry Roche, editor-in-chief

Anyone can grow grass, says one noted golf course superintendent. But not anyone can become a successful superintendent simply because he or she can grow grass.

As has been said before, in this magazine and at many educational seminars around the country, being a golf course superintendent means mastering several very diverse disciplines from weed management to equipment repair. But sometimes even that isn't enough; sometimes it takes a keen imagination, the ability to implement plans and to prioritize.

Planting annual flowers, for instance. Down in the Palm Springs, Calif. area where Jeff Markow is superintendent at The Vintage Club, it's not uncommon to see annual color. Markow's crews plant 80,000 flowers each year.

Markow likes to instill the credo "no grass blade out of place" in his crew members as the course seeks perfection in all it does. "We promote that feeling within the crew to the point where they care about the course and where it's not just a job to them," Marko says.

Other things work in other parts of the country.

Jeff Markow and the crew at The Vintage Club in Palm Springs take pride in the 5,000 flats of annuals they plant each year. Among the most popular: petunias, pansies, snapdragons, impatiens, cyclamens and alyssums.

People management

Stanley Reedy

"If your membership likes you, you'll be successful," says Stanley Reedy of Castlewoods Country Club, Jackson, Miss. "The closer you get to your members, the better you'll understand them. Getting out and playing the course with them is a big thing.

"Members know what they want, so you've also got to be honest with them and tell them what you can and can't do."

Bob Randquist

Bob Randquist of Southern Hills Golf & Country Club concurs. "You have to be highly visible—there are times that's not always pleasant," he says. "You can be around them *too* much, but there's a middle ground there somewhere.

"You also have to work with people in things like hiring and motivation. A lot of it takes time and experience, and many times you can't do it by yourself. Eighty percent of my crew has been here at least six years."

Randquist notes that being around when you're needed is a key.

"Some supers like to get away when things get rough, go chasing engine parts or something. But that's not what we're getting paid for."

Proper education

D.J. Pakkala

D.J. Pakkala, of International Golf Management in Carmel, Calif., thinks having one man in charge of many courses is becoming a common job description.

Today, college training is an important first step for turf managers.

"The business is now so technical," says Pakkala. "You're more involved with the environment, more familiar with the laws that have to do with chemicals and their effects on the environment. I don't think there's any other way of being successful in the business without having been trained in a college or university."

Fine-tuning greens

David Stone

David Stone at The Honors Course, Ooltewah, Tenn. has his crews spend extra time on and around the greens. "Every golfer—no matter how bad—has to play the greens," he says. "They might miss the fairways, but they've got to play the greens."

Stone and his crews take extra pride in keeping collars uniform from hole to hole. They use a specially-built bar on their greensmowers to assure the uniformity. And, during the hot months, greens are constantly checked for soil moisture to keep them uniformly firm.

Sand traps are also hand-raked instead of machine-raked. Crew members responsible for hand-mowing greens take leaf rakes along.

Chain of command

Joe Hahn

"We have a system set up with qualified people," says Joe Hahn of Oakhill (N.Y.) Country Club. "I surround myself with people interested in the business who have a desire to move up themselves. I have a superintendent on each course that I try to keep for about three years; I always have a college graduate underneath them waiting to take their place, and a couple of turf students during the summer on each course.

"There are five guys who have gone out as superintendents on their own in my eight years here."

Prioritizing

Ted Horton

"We try to get most of our jobs set up in order of priority according to what the membership wants," notes Ted Horton of Westchester Country Club, Rye, N.Y.

"We've always got a list of 'honeydew' items—crazy things you want to get done for the members—and we've been nibbling away at it for years."

Horton talks about first impression areas. "We periodically go through and look out all the building windows, to see things the members see.

People like to see the little changes we make."

Westchester also enlisted Reece Jones & Associates to provide a master plan with a list of minor projects "we're ready to roll on." Included are long-range planting and long- and short-range tree maintenance plans.

"We were also one of the first courses involved in fairway triplex mowing, which was popular with the membership. We rode that crest for a few years," Horton notes.

Ornamental grasses

John Moorman

Hillcrest Country Club in Batesville, Ind. was one of the first courses in the country to use ornamental grasses in its landscape. The move has paid dividends for superintendent John Moorman.

"We've used thousands of ornamental grasses over the years," he says. "They've really set us apart and have gotten a lot of response. They give the course sort of a Scottish look."

Moorman points out that ornamental grasses are neither costly nor labor-intensive.

"They're perennials; we've had some of them for nine years. You just cut them off at ground level in the early spring and watch them grow."

Moorman says that a two-gallon container will cost $6 to $8. Hillcrest uses up to three containers in each planting hole, but if you're willing to wait a couple of years for the grasses to propagate, one container per hole is plenty.

Emphasizing beauty

Don Sweda

"We emphasize the beauty and scenery of the course," observes Don Sweda of Beechmont Country Club, Cleveland, Ohio. "When a person has to wait on a hole, if his overall surroundings are pleasant, then it turns into a pleasant experience."

Sweda's crews work extra hard on the entranceway, heeding the old adage "You only get one chance to make a first impression." He says that "before a person has even set foot on the golf course, he (or she) has established an overall impression."

Managing water

Bill Knox

"It's very critical to be a judicious user of water," notes Bill Knox of Greystone Golf Club, Birmingham, Ala. "Using water wisely improves turf quality, density and looks, plus it's money- and labor-saving."

The first step toward being a wise water user is "hands-on, out in the field," Knox says. "You've got to continually monitor soil moisture with a soil probe and then plug it into your computer."

Communicating with your irrigation distributor is an important key, too. Knox bought his Toro 8000 water management system for his deep-South bentgrass greens from Turf Care Products in Birmingham. **LM**

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Cutless.

The unique turf growth regulator that gives your course a bottom line boost:

More playability.

This is where perfect lies start on your fairway. Cutless* 50W turf growth regulator from DowElanco. Our free technical guide has all the details.

You'll read how Cutless, unlike other growth regulators, doesn't stop the development of warm and cool season turfgrass. Instead, it reduces or slows your turfgrass's growth rate by shortening the internodes of the growth stem with no adverse effects in their roots. The result is improved turf quality and more playable fairways.

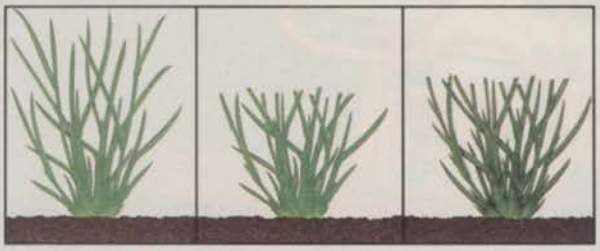
With Cutless, your turfgrass appears thicker and stronger for a denser, more consistent playing surface. Golf balls just naturally sit up better.

For golf course superintendents, Cutless is like a maintenance program in one product. You'll see dramatic savings in grass clippings — up to 50% less. And mowing frequency — up to 33% less. You can also mow in less time with less strain on your equipment. You not only save time and labor costs, you can also manage your hard-to-mow areas more efficiently.

Cutless reduces your water use, too — up to 30%. So there's less turf wilt. And lower irrigation costs.

But numbers aside, your turf just plain looks better. Cutless gives it a rich, darker green color for fairways your golfers will love to play on.

Here's another added benefit with Cutless. As your turfgrass grows up thicker and more competitive, there's less room for troublesome weeds to interfere. Cutless also helps crowd out *Poa annua* for conversion to a more desirable turfgrass such as bentgrass.



1. Sprig of grass in normal state.
2. Seven to 10 days after applying Cutless, mowed sprig sometimes exhibits slight discoloration of treated area and leaf tip browning.
3. Growth reduction peaks between third and eighth weeks, accompanied by darker green coloration and increased tillering.

Don't just take our word for Cutless. Take it from Scott Niven:

"I've reduced clippings 30 to 50% when we mow fairways. My guys don't have to empty the baskets as much, so we save time and money on labor. But I think the best advantage is the reduction in the amount of water you have using Cutless. It's a marked difference.

Scott Niven
Superintendent, Stanwich Club
Greenwich, Conn.

"Initially, you get so little discoloration with Cutless that a golfer would never notice it. But after four weeks, the difference was between night and day on how dark green the Cutless turf was.

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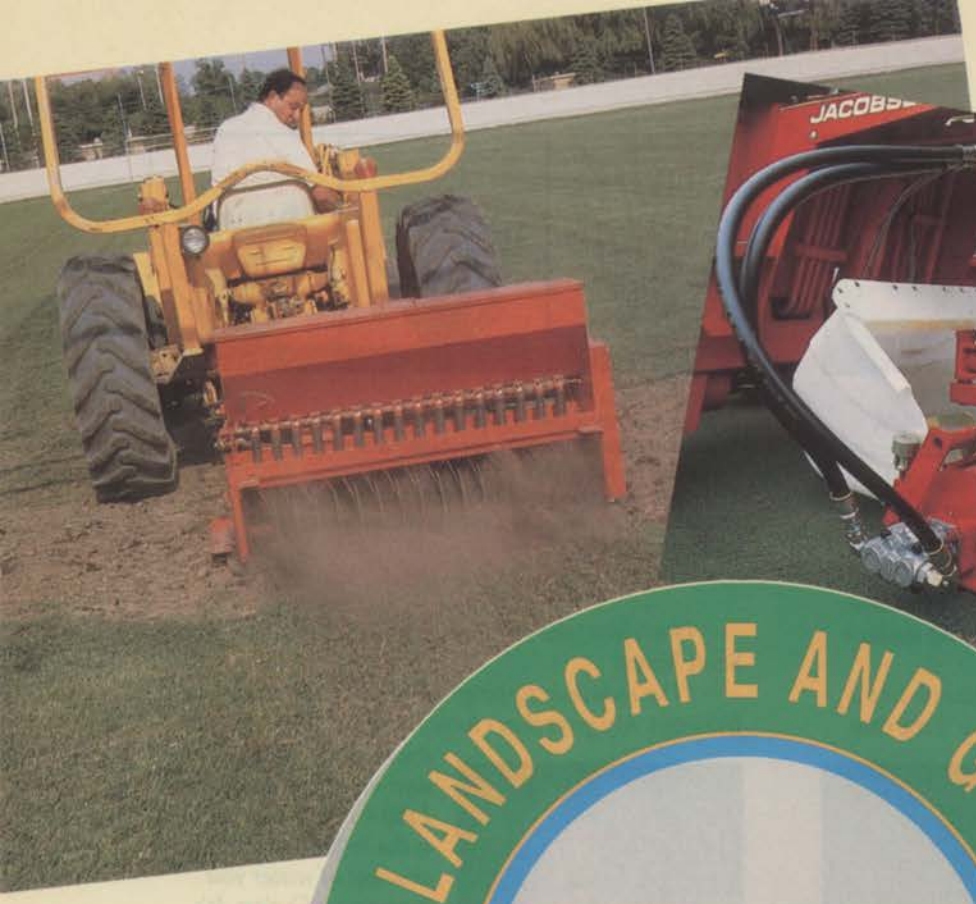


LANDSCAPE AND GOLF COURSE EQUIPMENT GUIDE

GUIDE TO LANDSCAPE AND GOLF COURSE EQUIPMENT

EQUIPMENT TIPS

Landscape contractors

- Use information from crew members to match the right equipment with the right job.
- If storage space is needed, consider providing landscaping for someone with storage space as a trade-out.
- Find one brand of equipment, and one vendor for parts.
- Send essential replacement parts with crews to the job site.
- Secure all equipment at all times from theft.
- Consider equipping a mobile repair shop.

Golf courses

- Let the operator know the cost of equipment and repairs; it might make a difference.
- Change oil religiously.
- Hold periodic equipment care reviews.
- Overhaul all equipment annually.
- Don't become "parts poor." Keep replacements for only the most breakable parts.
- Insist on good dealer service.
- Keep repair and storage areas neat. Know where everything is kept, and keep it there.

FOR LANDSCAPE CONTRACTORS:

YARDMASTER
Painesville, Ohio

Storage is the biggest problem for Yardmaster. Although the company holds annual used equipment sales, it still requires space for overhaul and clean-up.

Landscaping manager Ed Gallagher says the options are limited: "You either build storage, or push some other equipment out." But the company has found a partial answer to the space problem: it has a nifty trade-off arrangement with a neighbor, landscape services for storage space.

And then, of course, there's equipment costs.

Replacement parts have been referred to as the "black hole" on Yardmaster's balance sheet. Gallagher says that, if left unattended, parts expenditures put a serious dent in profits.

"Especially," he explains, "if you have several different models. You may find a problem with finding accessible parts.

"The best thing is to get one (brand), and one vendor for parts."

Gallagher suggests that high parts outlays might indicate equipment abuse.

"I sensed when I started here that we had a lot of spare parts," Gallagher remembers. "Our foremen weren't that willing to really take care of equipment, knowing there was another piece of equipment out there, or that there were ample parts. Once you squeeze that, they take better care of it."

Yardmaster's Ed Gallagher: Keep an eye on parts expenditures.

The most breakable parts are belts, pulleys and bearings. Yardmaster mechanics change equipment oil twice a week, and do performance checks nightly. In addition, crew foremen are trained to do small on-site repairs. "Foremen have the essential tools and parts—belts, pulleys, blades, oil—to get through the day," explains Gallagher. "If they can't do the repair, the small engine mechanics go out."

THE PLANT CARE CO.
Dallas, Texas

The Plant Care Co. has a continuing problem with equipment theft while crews are manicuring commercial properties.

"A lot of it is employees of our accounts," notes vice president/general manager/managing partner Mike Choate. "We use locked Wells Cargo trailers with instructions not to take any equipment from the trailers unless it will be in use. But we've still lost $2,000 in equipment this year, and in past years it's been much more."

Still, Choate and his partners are sticking to their system, which includes backup equipment locked in cages in the company's storage sheds. Their equipment expenditures-to-revenues ratio has been three percent in recent years, compared to an average of five percent for most other companies.

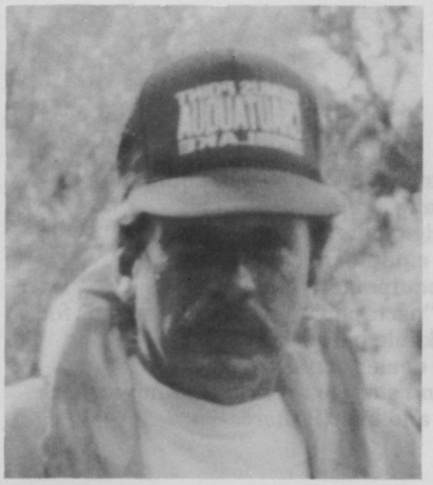
Though The Plant Care Co. doesn't have a mechanic on its payroll, it has a sweet arrangement with a shop within one-fourth mile of it. "We're No.1 on his list for immediate repair and we pay him well to do it. It's still much cheaper than having another employee," observes Choate. "We also bring him in periodically—usually during the winter—to sit down with our guys and go over equipment maintenance with them."

BUTLER LANDSCAPING
Willoughby, Ohio

Richard Butler of Butler Landscaping

maintains 80 lawns per week with a seven-man crew. Equipment breakdowns are something he can do without.

"We do between six to eight houses an hour," Butler estimates,"except for in early spring, when we do four



Richard Butler: Uses mobile repair van.

per hour. The worst thing you can do is to have seven guys with only two mowers working. We always have backups."

To "keep 'em cutting," Butler has a van he's turned into a mobile repair shop. "We come in with a good size crew. The thing to do is be prepared."

The van is equipped with most of the often-needed parts; a nearby Lesco outlet provides other parts as needed.

LANDSCAPE SERVICES
Fort Wayne, Ind.

Like the Ford Motor Co., with Landscape Services, "Quality is Job 1," says president and co-owner Dan Skinner. Likewise, finding the right equipment for the right job is a high priority.

"We count on our crews for their input," says Skinner, whose company will be expanding this season. "They're the ones using the equipment."

Because Landscape Services' clientele is 85 percent custom luxury residences, "the 48- to 52-inch walk-behind is the backbone of the maintenance division. Riders have proven to be too big for our use," Skinner notes.

Special maintenance practices like turf fertilization and weed control, large tree work and irrigation installation are sub-contracted, thereby eliminating the need for specialty equipment and more employees.

HICKORY HILL
Atlanta, Ga.

Owner Ted Davis doesn't buy much equipment because of the size of his company, but he prides himself in being an astute buyer.

"I try to keep up with what's good in equipment by talking to different vendors," says Davis. "If I see a new piece of equipment on a lawn, I'll even stop and ask another contractor—even if he's a competitor. I always try to find someone who's got a certain piece of equipment before I buy."

Davis finds that being a very selective buyer, plus having a preventive maintenance program in place, means less downtime and more profit in the intensely competitive Atlanta area. □

CORE AERATOR GAINS POPULARITY

Lately, says Ed Devinger, the most popular piece of equipment among landscapers is the core aerator.

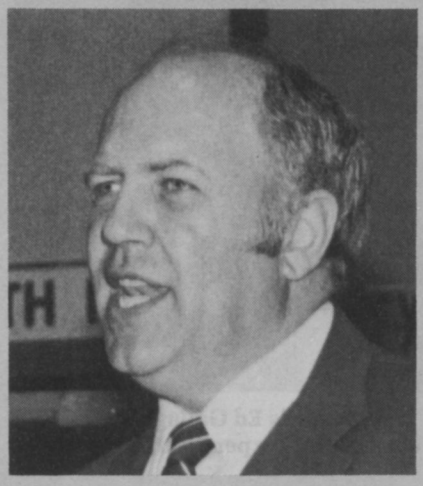
"Aeration is increasing by leaps and bounds," says Devinger of Reinder Brothers' distributorship in Milwaukee, Wisc. "We've been preaching that for a great number of years. It's the single most important thing you can do (for healthy turf). Unfortunately the equipment that was available years ago didn't do it very efficiently and it wasn't that profitable. Today, they have the equipment that'll do it."

Devinger thinks solid tine aeration is nearing a phase-out, as the benefit does not justify the cost. Other turf experts agree that the depression made by solid tines close up too quickly.

"The newest innovation is the Toro Hydroject 3000. If it works and can be produced at a more cost-efficient level, and we can get that into the lawn care market, now we're talking."

Devinger says the Hydroject, which uses high pressure water to make cores, eliminates the clean-up required with core aerators.

Devinger says Toro is trying to



Ed Devincher, Reinder Bros.

make the unit more affordable for the lawn care market.

How do they manage?

Devinger says equipment leasing is more popular than before. "(Customers) are riding out the payments a little more to match income."

Devinger foresees a good year for the industry. "If there is a downturn, I don't think our industry will see it in 1991; maybe 1992." But no matter what happens, "the people with money to spend will spend it."

Expanding services

Contributing to the health of the industry, says Devinger, is the increased number of lawn care companies venturing into added services.

"Today, these (maintenance companies) are trying to do everything, because the demand requires it. They want one person to do it all: trim bushes, spray trees, plant flowers."

On the fairways

Devinger says golf course managers are moving toward downsizing, to minimize course wear and tear:

"Fifteen years ago they were going to as big a mower as they could to cut out as much labor as possible. Today it does not seem that the labor is that critical. They're demanding a finer groomed golf course. Every year it's getting more refined. They're raking sand traps every day.

"What membership is saying is that they want a tournament golf course every day of the week. It is just incredible the amount of labor it is going to cost."

—*Terry McIver*□

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Landscape Equipment

Company	Revenues	Accounts	Acres	Walk-behinds, Push mowers	Riding mowers	Edgers, Trimmers	Blowers	Other	Mechanics	Budget
Butler Landscaping Cleveland, OH	$250,000	80	36	11	3	3	5	1 Rototiller 1 Dethatcher	0	Buy as needed
Hickory Hill Atlanta, GA	Under $100,000	25	5-6	8	1	5	5	1 Spray truck	0	$6,000
Landscape Services Ft. Wayne, IN	More than $1,000,000	38	25	11	2	3	5	1 Pickup 1 Dump truck 2 Trailers	0	$10,000-$15,000
The Plant Care Co. Dallas, TX	$1,500,000	125	42	2	44	12	12	4 Vacuums 1 Tractor 2 Loaders	0	$18,000
Summer Lawns Boise, ID	More than $100,000	35	N/A	5	1	5	3	3 Tractors 2 Trenchers 1 Loader 6 Pickups 1 Hydroseeder	0	Buy as needed
Yardmaster Painesville, OH	$6,000,000	130	N/A	50	16	47	10	14 Trailers 17 Pickups 10 Dump trucks 8 Loaders	5	$100,000

FOR GOLF SUPERINTENDENTS:

SPRINGVALE COUNTRY CLUB
North Olmsted, Ohio

Preventive maintenance begins with the operator, according to Springvale Country Club superintendent Bill Prest.

Riding equipment that doesn't require much physical labor is manned by an older, often retired worker. Prest swears that maturity counts. Older workers are more familiar with the equipment, and don't abuse it.

Seasoned workers also have a better ear for knocks and pings, and are flat-out more concerned and careful.

At Springvale, every operator reads the operation and maintenance manual first thing. Prest has four greensmowers, allowing for convenient rotation.

Prest is most concerned with service. The mower dealer he works with "will provide a backup piece if we have send the mower in for repairs. We try everybody's and pick the best one."

Prest looks at four things when buying equipment:

- ease of operation
- maintenance requirements
- parts availability

Bill Prest: Older workers care.

- availability of service

"This (part of the country) is competitive, so anytime we want a piece of equipment, (dealers) are more than happy to bring out a demo model."

TREYBURN COUNTRY CLUB
Bahama, N.C.

Dale Miller doesn't mess around when it comes to taking care of equipment. He recently persuaded his membership board to allot him $125,000 per year until he does a complete turnover. He initially wanted $250,000, but settled for half. He annually spends $36,000 for repairs.

Miller says equipment replacement occurs in cycles. "After the third or fourth year you have to start turning over equipment, and might need in the vicinity of $50,000 to $100,000 each year," he says.

"I like to maintain a parts backup. We service equipment regularly, so we spend quite a bit of money on service. Just taking care, making sure it's working absolutely perfect. If the equipment out here wasn't so old, I'd say we wouldn't have to spend but $25,000 a year. Right now we'll spend a lot in engine repair.

"We maintain an incredible backup parts supply. We can immediately fix everything that might breakdown, short of major repairs. And we always have backups."

Care is the watchword at Treyburn. "Each piece of equipment is steam-cleaned and pressure washed, and parked where it belongs.

On a golf course a bad score should be the only thing that stinks.

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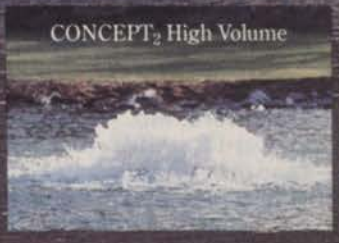

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Golf Course Equipment

Golf Course	Acres Mowed	Fairway Mowers	Greens Mowers	Aerators	Power Rakes	Trimmers, Whippers	Other	Mechanics	Budget
Springvale Country Club N. Olmsted, OH Bill Prest, superintendent	140	1	4 Ride 4 Walk	1	1	4	3 Rough mowers 2 Utility vehicles 1 Truckster 2 Tractors 1 Pickup 1 One ton dump truck	1	Buy as needed
Longview Golf Course Baltimore, MD Howard Gaskill, superintendent	160	2	3	3	1	6	4 Utility vehicles 1 Fairway aerator 1 Backhoe 2 Tractor-drawn leaf blowers	1	Buy as needed $18,000 for repairs
Rock Island Arsenal Golf Course Rock Island, IL Jon Scott, superintendent	150	3	2	2	2	4	1 Rough mower	2	Buy as needed $17,000 for repairs
Treyburn Country Club Bahama, NC Dale Miller superintentent	100	2	10	2	2	8	3 Rough mowers 4 Drop spreaders 2 Triplex trimmers 5 Fly mowers 1 Overseeder 2 Tee mowers	2	$125,000 for total turnover 3-years $36,000 for repairs

"We do keep track of (abuse) problems, and if we notice an employee is having trouble, he's usually terminated. But most of the time, once they get their hands on new equipment, something that'll do the job for them, they'll take care of it."

In this and his past two superintendent posts, Miller has found that women workers take better care of equipment than do men. "I hire as many women as I can just for that reason," he says. "They do a hell of a job." Miller's 25-person crew includes three women.

LONGVIEW GOLF COURSE
Baltimore, Md.

Howard Gaskill's responsibilities extend over three 18-hole county owned courses. All average about 160 acres, and Gaskill has his equipment divided up pretty much equally among the three.

"We put most of our equipment away in the winter, whether it needs it or not," says Gaskill. "We repair every seal, bearing, shim and spacer."

Along with regular maintenance, Gaskill has new workers familiarize themselves with the equipment before they read the manual. Then, after a supervised ride, they sit at the controls and go through all procedures a second time.

"It's almost impossible to recruit retired people," says Gaskill, who has worked with them in the past, and admits that age counts for something when it comes to equipment care. Still, Gaskill thinks his training program does a good job in fostering responsible operation.

ROCK ISLAND ARSENAL GOLF COURSE
Rock Island, Ill.

Jon Scott gets 10 good years of service out of his greens aerators, seven years out of his two power rakes, and five years of service from his fairway units.

His secret is "preventive maintenance, oil changes and a good winter overhaul." All equipment is ready for the new season by the end of March.

He extends the service life of two triplexes after three years by converting them to tee mowers for another four years. **LM**

Howard Gaskill: Tear it down, whether it needs it or not.

Jon Scott: Greens mowers converted to tee mowers after a few years.

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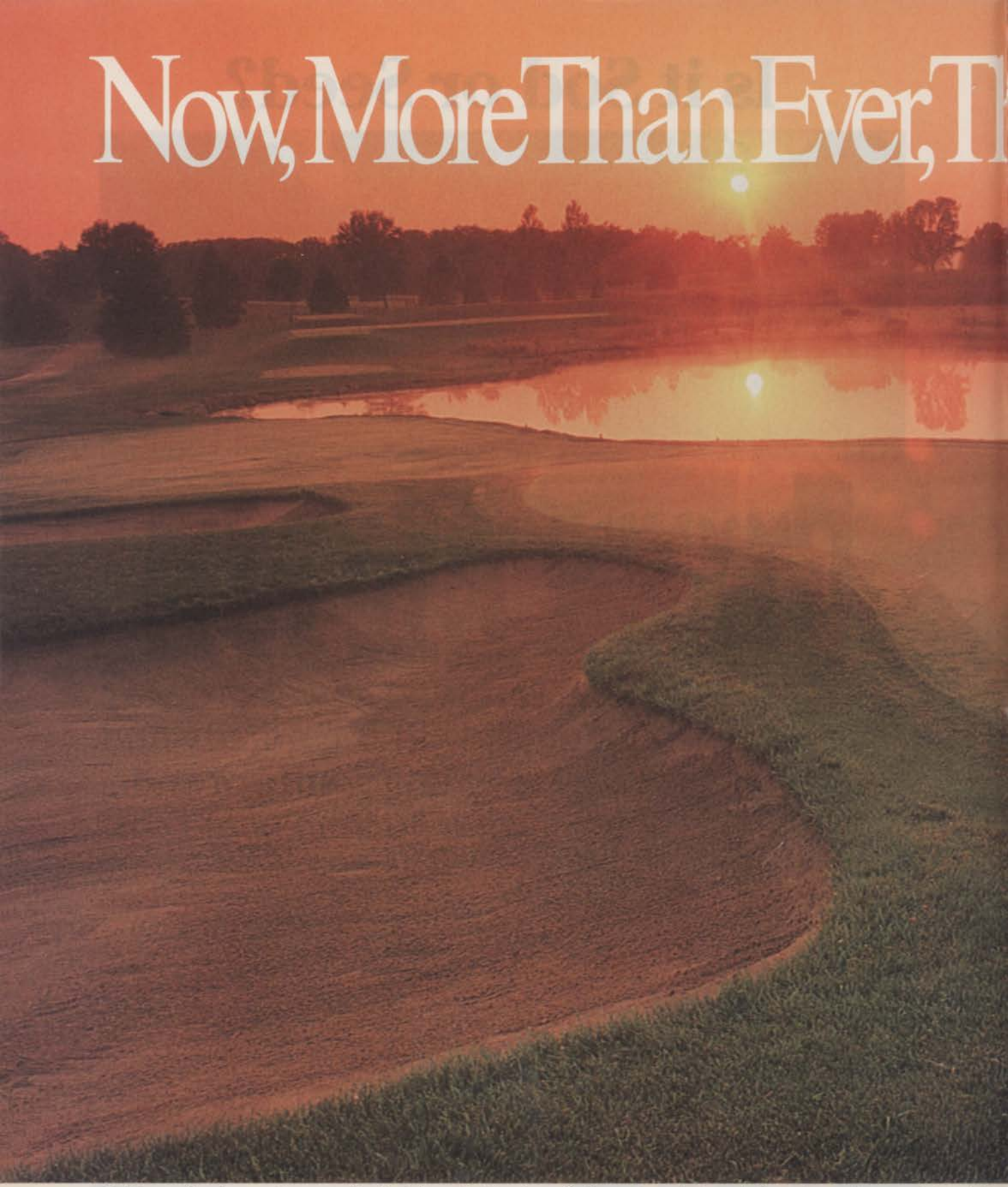

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SAFE AND SECURE

If you venture into landscape lighting installation, learn to choose the proper mounting accessories.

by Phil Henry, Stonco Lighting, Union, NJ.

In recent years, electrical contractors nationwide have successfully entered the landscape lighting business. A business opportunity first realized in California, Florida and Texas in the early 1980s, landscape lighting has now become popular in the Northeast and Midwest.

As electrical contractors scramble to capitalize on this growth, one of the challenges they've faced is in determining the proper way to mount landscape lighting fixtures.

The right mounting acessories can simplify fixture installation, save time, minimize callbacks and satisfy the customer. They will also make you look like a hero to landscape architects and landscape contractors, who often subcontract out the electrical work to you.

This article aims to help you choose the right mounting accessories so your landscape lighting jobs will go smoother, quicker, and become more profitable.

Line vs. low voltage

Before you select lighting accessories, first identify the type of landscape lighing system you'll be installing: line voltage or low voltage. The newest accessories accommodate line

Line voltage systems are installed at commercial facilities or upscale residences, where the fixtures will be permanent. They employ 120-volt power and require junction boxes and underground conduit or UF cable.

Low voltage systems, on the other hand, are moveable. They employ a transformer to reduce the voltage from line level to low-voltage (12 volts), and direct-bury cable. As a result, such systems can be easily installed by either a homeowner or an electrical contractor.

Know your options

Once you've identified the landscape lighting system, then choose mounting accessories. To make sure you select the right ones, however, keep an open mind.

Don't automatically return to the accessories you've chosen in the past.

continued on page 42

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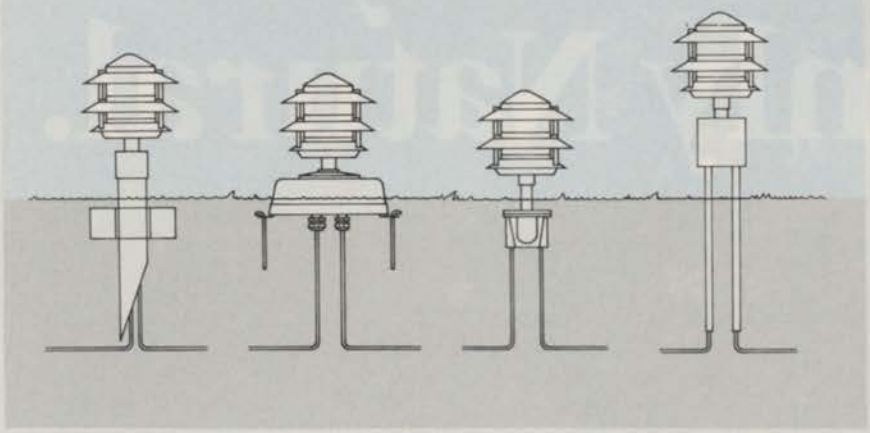
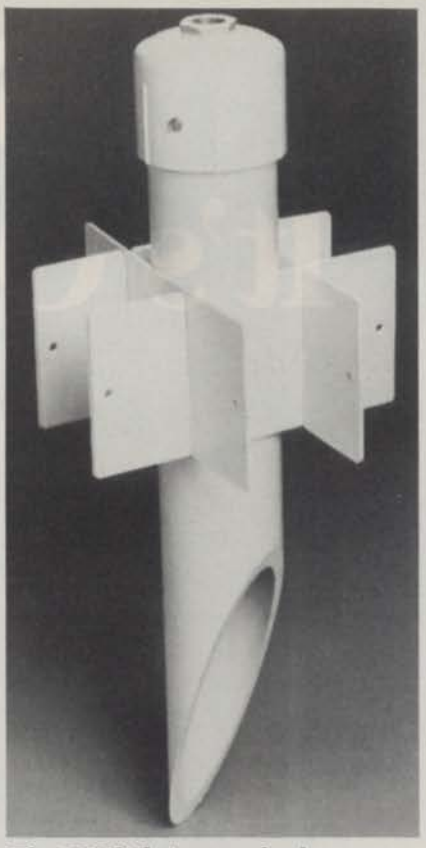


New and conventional landscape lighting mounting accessories, shown installed. From left to right: PVC lighting standard or post, light block, buriable box and FS box.



The PVC lighting standard or post will not corrode as do steel or aluminum accessories because the risers are made of PVC.

More accessories are available now than ever before. As a result, it pays to become familiar with all the choices. A newer model may offer better corrosion resistance or easier installation than an old standby.

The selector chart in Fig. 1 outlines the most common mounting accessories: posts, light blocks, buriable boxes and standard FS boxes. It compares them in terms of constructiion material, installation/wiring, aesthetics, stability and application. Here's a closer look:

Post lighting quick, easy

The newest innovations in mounting accessories are corrosion-resistant permanent posts or lighting standards. Made of PVC, these posts will not corrode like conventional aluminum or steel mounting accessories. The reason is the risers are made of PVC as well.

Installation is quick, easy and neat. After trenching, you simply run UF cable into the post, then into the ground, and attach the fixture to the nipple at the top. There's no need to cut or bend pipe. This procedure reduces actual installation time dramatically. Some posts even have slanted bottoms to accept cable at different depths.

For stability, certain posts have built-in stabilizers, anchored to the posts with a couple of self-tapping screws. This makes these units less susceptible to vandals. For this reason, such posts can stay buried in the ground, risers and all, without ever needing replacement.

Studies have shown that these posts will be just as stable three years after they've been installed.

Light blocks

Another mounting possibility is the light block with an integral splice box. Although a light block is slightly more expensive than a post, it's also more aesthetically pleasing. The light block is recessed into the ground, so a beautiful landscape is not distracted by mounting hardware.

As far as construction materials go, your best bet is a light block made of pre-cast concrete instead of poured concrete. This avoids waiting for concrete to set overnight, and also eliminates sloppy forms, time-consuming component assembly and box leveling.

continued on page 58

Figure 1.

Common Lighting Accessories

	Construction Material	Installation/ Wiring	Aesthetics	Stability	Application
Posts	PVC	Trench, run UF cable into post into ground, attach fixture to nipple	Good; only six inches, visible above ground	Recessed, built-in stabilizers	Landscape, sign, facade, accent lighting
Light Blocks	Pre-cast concrete	Drop in place, wire via access holes in bottom	Excellent: recessed into ground	Stakes used to support	Same as above
Buriable Boxes	Cast iron, with hot-dipped galvanized finish	Drop in place, wire through access holes in bottom	Excellent; flush with ground	Box recessed into ground	Same as above
FS Boxes	Die cast aluminum	Requires conduit connectors, cutting and bending conduit	Poor; bulky	Not generally stabilized	Same as above

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Contractors report that a pre-cast concrete block can save up to 24 hours in labor and installation time.

Installation involves dropping such a light block in place and wiring up through access holes at the bottom. Stakes driven through tabs keep the mounting accessory firmly in the ground, so it can withstand abuse from lawnmowers and edgers.

Underground boxes

Topped with any single-gang FS cover, a pre-cast light block can hold a wide range of landscape lighting fixtures and floodlights for sign or building lighting.

Even less visible in a landscape than light blocks are buried boxes. They are flush with the ground, so only the fixture sticks up from the soil. Typical construction material is cast iron. Some are available with a hot-dipped galvanized finish to resist the corrosion that occurs when metals interact with soil over time.

After the box is set in the ground, the contractor can wire up through access holes at the bottom. If the cover has a ½-inch hole—as most do today—the contractor can then attach any fixture with a ½-inch arm. This differs from conventional FS boxes where ground level installation requires conduit connectors and all electrical connections are made inside the box itself.

Selection guidelines

After you've familiarized yourself with all the options, select mounting accessories. The following tips should help you with that task:

● **Choose mounting accessories that accommodate ½-inch arms.** This will facilitate installation of landscape lighting fixtures as well as incandescent and low-wattage flood lights. Nowadays, most of these fixtures come standard with ½-inch arms.

continued on page 46

Lighting provides security, beauty and savings

by Kathi Haskell, Watergrove Apartments

The Watergrove Apartments in Memphis, Tenn., is a rental community of 1002 one- and two-bedroom units. Developed in 1984 by Fogelman Properties, Inc. (FPI), of Memphis, Watergrove was little more than a swamp which had long been considered unbuildable. Relying on effective landscape architecture, FPI has turned Watergrove into a spectacular award-winning project. At night, Watergrove becomes particularly extraordinary thanks to the lighting system created by Fogelman/Byrnes & Doggett.

It was our objective to install effective street lighting. We wanted people to obtain a strong sense of security. We also wanted the lighting to contribute positively to the appearance of the community, and to otherwise contribute to the development's success.

Working with Memphis Light, Gas & Water, Watergrove developed the street lighting plan relying on traditional pole-mounted luminaires employing high-pressure sodium (HPS) lamps. First, the lamps' "golden white" color is distinctive, permitting us to better define circulations throughout the project. In addition, HPS lamps are among the most efficient lamps available and have a rated life of more than 24,000 hours. In other areas, we used more traditional "white light" sources. Thus, metal halide and incandescent lighting is used to highlight the bridges, pools, and clubhouse, and quartz lighting is used to illuminate six "floating fountains" installed in natural pools. Using different types of lighting in this manner creates a tremendous amount of variation which enhances the beauty of the overall scheme, while also improving functionality.

Lighting at the Watergrove Apartments has enhanced the development's reputation as a safe place to live.

Safety always first

Safety is one of the most important benefits we wanted to derive from our lighting system. We designed the lighting to help prevent slipping or tripping accidents such as those that can occur in a parking lot or on a walkway at night.

Security was another attribute we wanted to design into the system. In addition to providing safety, lighting in parking lots also helps prevent auto break-ins. Also, our surveys showed that many residents would be young women. Their needs have been realized, and it is obvious to them as they approach Watergrove at night.

Added value is impressive

The value added to the development by landscape lighting can be impressive.

The lighting we designed for Watergrove has helped enhance the development's reputation and public recognition. Now, management does not need to employ the extensive media advertising that otherwise be required to achieve the desired occupancy.

More prospective renters are looking for apartments at night. This gives us an opportunity to demonstrate our landscape lighting. This has also given Watergrove an advantage during the winter months, when darkness falls earlier in the evening.

Longer tenant retention

Research shows that the average tenancy in Memphis is about one year. At Watergrove, the average stay is 25 percent longer. While some of this can be attributed to certain amenities which other communities may not have, surely the community's most unique element is the lighting and its nighttime appearance. The lighting makes people feel safer at night, encouraging them to use the community more. □

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● **If possible, select mounting accessories made of corrosion resistant materials, instead of conventional steel or aluminum.** Preferred materials include PVC, cast iron with a hot-dipped galvanized finish or pre-cast concrete. They'll prevent the interaction with soil that causes corrosion. As a result, the accessories will last longer. If you choose a PVC accessory, make sure the unit itself is UL listed for wet locations. Some accessories available today are constructed from UL-listed materials, but the units themselves are not UL listed as splice chambers.

● **Look for mounting accessories with inground stabilizers, to keep them secure in the ground.** Such stablizers prevent shifting, tilting and damage from lawnmowers, harsh environmental conditions and/or vandals.

● **Choose accessories with threaded metallic hubs, instead of plastic ones.** Since most fixtures are constructed of metal, metal-to-metal contact facilitates grounding. It also simplifies installation by preventing cross-threading.

With landscape lighting expected to grow at 10 to 15 percent a year over the next five yuears, it pays to learn as much as you can about mounting accessories. Choosing the right ones can get you and keep you entrenched in this profitable business. **LM**

Bright ideas for landscape lighting

The key to good landscape lighting is expanding space after the sun goes down. "Landscape architecture is both a science and an art," says Rick Tomko of Site Illuminations, Cleveland, Ohio. "The goal is to create a useful and safe natural environment."

Tomko says it's important to provide just enough light so people can move safely through an area. Too much light makes surrounding areas even darker and more unsafe.

When designing lighting Tomko says to keep in mind that it's important to see the effect of light, not the source. "One has to start thinking of the designer as the perceiver," he says.

Let the client decide if they want colored lights, since colored lighting is subjective and emotional and brings out different patterns and textures.

Tomko recommends following these steps in planning a lighting design:

● **Define the problem.** Don't go into the project with anything pre-determined.

● **Set your goals.** Select plants and objects within the space that will be highlighted. Provide spacial definition for people moving within the area.

● **Do an analysis of the existing situation.** Know where people will interact. Know what the future plans are for the space. How will it look in several years?

● **Be aware of light pollution.** What is happening off-site? Is light streaming into a neighbor's window? Is it affecting planes flying overhead? Check into any ordinaces regulating light use.

● **Synthesize the information.** Pull together all information and make value judgements.

● **Determine the source the light.** What kind will you use? What color?

● **Determine the distribution and intensity of the light.** How much will accomplish your goals?

● **Evaluate the project.** This is the only way to determine if the project was a success.

Some other suggestions:

● Clear mercury vapor lights give off blue and green hues which make them ideal for landscape lighting. Be careful, however: they make people look bad. They also cause a loss in red tones and shouldn't be used on red annuals.

● High-pressure sodium lamps, while efficient, give off yellow and gold tones, making plant material look hot and dead. Palm trees are the exception to this.

● Sometimes putting signs like "Caution: 480 volts" on a temporary light display can deter vandalism.

● Lights do attract bugs, which is an advantage for using a downlighting or moonlighting technique. That technique uses a fixture up in a tree, which will pull bugs away from a socializing area.

● Every two to three years the staples holding a fixture to a tree should be pulled out and refixed.

● Using colored lights is subjective and emotional. Different colors bring out different patterns and texture in buildings. Therefore, always let the client decide if you want to use color, since trees grow in diameter. □

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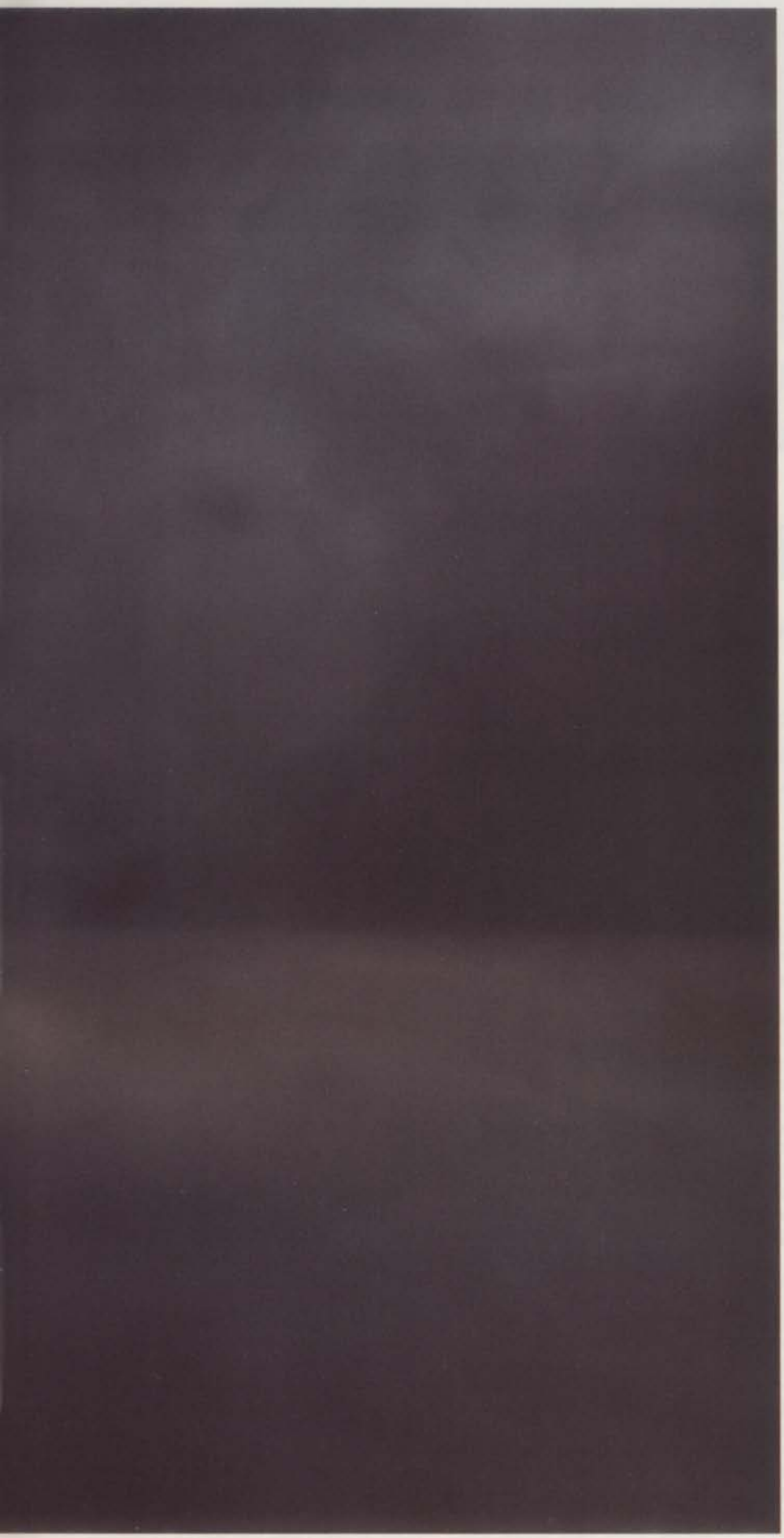

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TOP REVENUE WITH GOLF CARS

A grab bag of ingredients influences a golf course's profitability: course layout and design, length of playing season, membership base and club patronage. But how about the golf car fleet?

by John Allison, Yamaha USA

Few factors are as important to the successful long-term profitability of a golf course as a reliable revenue-generating golf car fleet. The fleet is a course necessity, both as a profit-generator and as a necessity for players.

Golf car fleets needn't be seen as a forerunner of all the calamaties associated with mechanized equipment, such as broken parts and long down-times. It's important to realize that with routine care and a healthy dose of common sense, your fleet can make the course more profitable and become one of your most outstanding assets. To look at it another way, a fully operating fleet earns revenue that can compensate for other non-revenue-generating equipment like mowers, trenchers and tractors.

Impacting profits

So what can be done to impact course profitability with a golf car fleet?

The answers lie in the product of basic management and maintenance principles, with special consideration given to issues such as a fleet's reliability, durability and reputation during the purchasing or initial rental processes.

For instance, the superintendent influences which types of equipment are purchased or leased. With responsibilities that combine grounds maintenance along with vehicle service and operation, the superintendent obviously wants to acquire a fleet that delivers top performance, maximum up-time and meets the demands of golfers—without the hassles associated with breakage, parts replacement and long hours of labor.

As a key player in the purchasing and rental process, the superintendent must overcome the temptation to look at overall cash outlays, loan amounts or total leasing figures for a fleet. He or she must concentrate instead on long-term profitability and a fleet's ability to withstand the rigors of constant use.

Once superintendents realize that a fleet's earning potential far overshadows any reservations about initial purchase costs or yearly lease commitments, they can make educated decisions regarding style, manufacturer and whether to purchase gasoline or electric types.

Cost of down-time

Every superintendent knows the extreme value of a fleet's total up-time; or to illustrate another way, the cost and lost profit opportunity resulting from down-time. The value of any car lies in its ability to deliver revenue from its daily, routine operation. Its value substantially declines if it's broken or non-operable. A fleet plagued by costly down-time is the source of golfers' frustrations, management concerns and diminished profits.

To help guarantee a maximum and speedy return on a golf car fleet investment, key golf course staff should immediately enact a well-thought-out maintenance schedule. This obviously assures maximum fleet performance and revenue. Sound maintenance, especially preventive maintenance, can and will extend fleet life significantly. As the superintendent fully appreciates the fleet's revenue-

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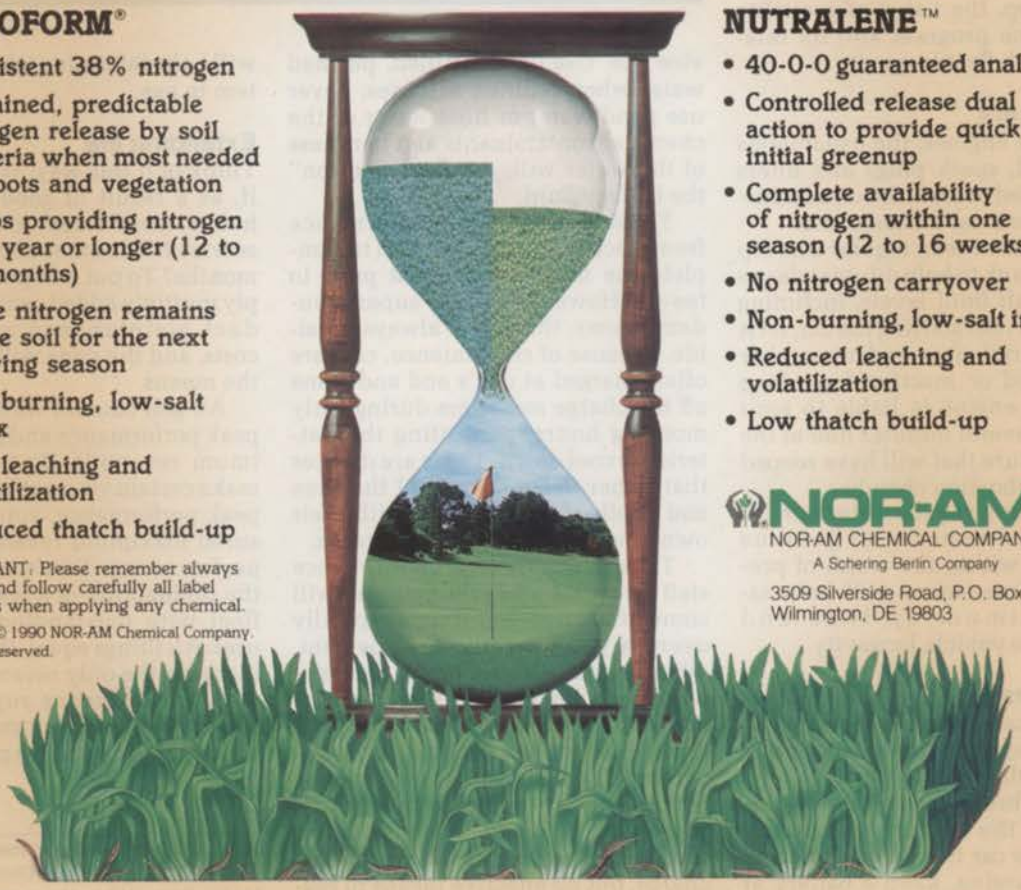

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generating capability, chances are that more deliberate steps will be taken to maximize its up-time efficiency.

To get the most out of your fleet, start with the basics. Develop and follow a comprehensive maintenance schedule, and keep accurate records of individual car's use. Insure equal use of all fleet cars by rotation; don't fall into the "last car in, first car out" trap, which unevenly distributes workload on select cars.

And to monitor costs, create a cost accounting maintenance chart that divides vehicle operation costs into two categories: "maintenance" (labor, service, fuel and parts associated with daily operations), like topping off the fuel tank, battery charging and cleaning; and "upkeep" (labor, service and parts that contribute to vehicle longevity and long-term performance), like tire rotation, filter replacements, engine valve adjustments, battery service and steering mechanism adjustment. In this way, daily operational costs and costs aimed at extending service life can be independently monitored.

You can thus show management the nominal costs associated with good upkeep, the value of a quality maintenance program and its relationship with fleet longevity.

Gasoline cars

For gasoline engines, the usual items like gas, oil, spark plugs and filters must be added or replaced on a consistent basis for a car's regular use.

If a car hasn't seen regular use, top off the fuel tank to help dilute stale gas and check all fluid levels, including the battery. After starting the car, let it run for a brief time and remember that if stored or inactive for a long period, the engine is liable to emit smoke for several minutes due to the gas/oil mixture that will have seeped into the combustion chamber.

Establishing regular intervals for in-depth maintenance of gasoline cars—tasks within the realm of preventive maintenance—will help assure maximum up-time and contribute to vehicle longevity.

Electric cars

For electric cars, several special maintenance procedures can drastically extend a battery's life. During a new car's initial break-in period, the service life of the battery will be extended if the car is only run 18 holes between charging. Keep a battery at least ¾ charged at all times. This not only influences performance, but keeping a battery at or near peak charge significantly extends its service life. Use only distilled, purified water when refilling batteries; never use pond water or hose water as the chemical contaminants and hardness of the water will, in effect, "poison" the battery fluid.

To obtain the best performance from electric golf cars, it's best to complete the fleet's charge just prior to tee-off. However, as any superintendent knows, this is not always possible. Because of convenience, cars are often charged at day's end and come off the charge sometime during early morning hours, permitting the batteries to cool down. There are devices that either delay or control the time and depth of charge, each with their own advantages and disadvantages.

Timers enable the maintenance staff to control when the batteries will come off charge, but timers typically overcharge an average of 22 percent, which wastes electricity and damages batteries. Since a battery operates stronger and longer when warm, golfers will be getting a car in peak performance. The disadvantage, of course, is that a battery's service life may be adversely affected. An automatic charger can better control the depth of charge, but no effective means to regulate the timing of the charge is available. In either case, examining variables such as weather, season, battery condition and fleet demand will help determine which type of system to use.

A preventive maintenance program and effective refueling/recharging practices are essential to revenue-producing golf car fleets.

A fleet plagued by costly down-time is the source of golfers' frustrations, management concerns and diminished profits.

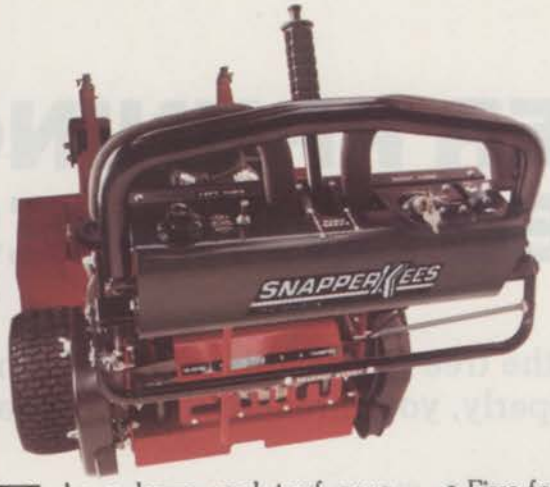
Extending life

Think of it this way: What is it worth if, as a result of good maintenance habits, your fleet's overall average service life is extended by a mere six months? To put it in perspective, simply multiply added rental fees and deduct maintenance and overhead costs, and the ends will surely justify the means.

All golf courses want to operate at peak performance and generate maximum revenues. By taking steps to make certain your golf car fleet runs at peak performance, you have also assured maximum revenue-generating performance. Don't underestimate the profitability of a well-maintained fleet with outstanding up-time figures. All things equal, the golf car fleet is among the only revenue generators with which greens superintendents can play a significant role and greatly impact overall course profitability.

LM

John Allison is field service manager in the Golf and Utility Vehicle Division of Yamaha Motor Corp. USA. He oversees all service activities for the firm's golf car line and functions as liaison between Yamaha and its network of more than 60 independent dealers nationwide.



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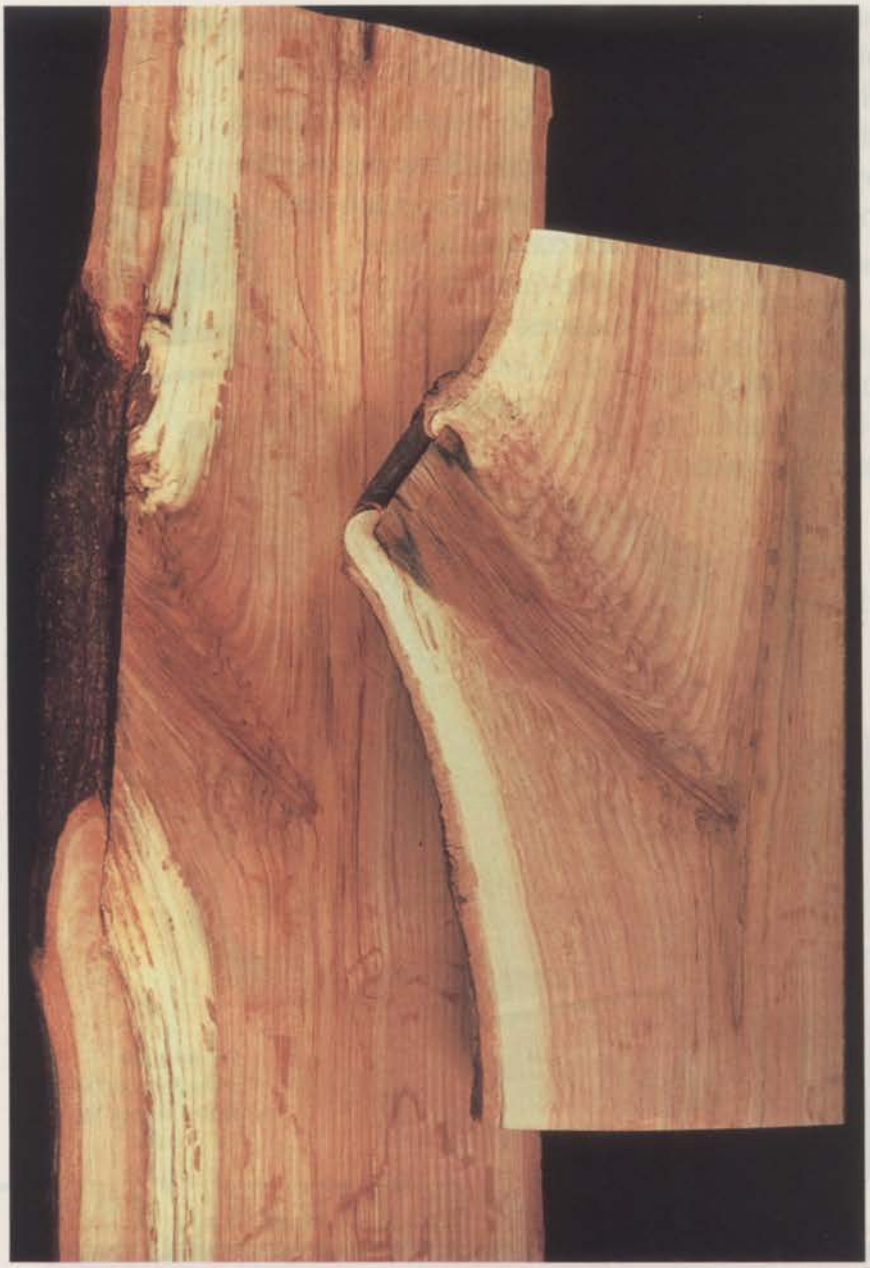
PROPER PRUNING RESPECTS TREES

If you prune properly, the tree can readily cope with the injury. If you prune improperly, you threaten the tree's health.

by Alex Shigo, Ph.D., Shigo & Trees, Associates



Two samples from the same red oak tree that had branches of the same size and age cut off six years earlier. The improper cut (left) had large ribs of woundwood and a large column of rot. No rot developed after the proper cut.

Proper pruning respects tree beauty and dignity, and helps maintain tree defense systems. Improper pruning, on the other hand, destroys beauty, dignity and defense systems.

Proper tree care starts with an understanding of how trees grow and defend themselves. Pruning is one of the beneficial tree practices. But too often, people think that because trees are so big and tough, you can prune them in any way and treat them in any way and they will continue to defend themselves.

We are seeing now that this is not so. There are limits to what a tree will endure.

Proper pruning is the removal of living, dying and dead parts of trees to benefit them. Pruning removes branches that could result in large wounds if they fell. It also corrects defective form that could result in branch failure.

It is time for some changes in the ways we treat trees. Decisions must be made on the basis of an understanding of tree biology. And, most importantly, changes must be made to seven tree pruning practices that cause serious injury.

1. Know the size and shape of the tree you want.

2. Do not flush cut.

3. Do not leave living or dead stubs.

4. Do not wait to top and tip large trees.

5. Do not over-prune.

6. If pollarding, start with a tree that lends itself to the practice.

7. Do not apply wound dressings over rotted or infected wood.

What you want

Besides knowing the size and shape of the tree you want, you also must know your planting site, and select trees that will grow best there.

Decide what kind of trees you want: tall, small, weeping, fruit-bear-

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ing, etc. Then learn what kind of site you have: wet, dry, acid, alkaline, clay, sand, etc.

When planting trees, keep these hints in mind:

- Plant at the depth the tree grew in the nursery.
- Do not fertilize until the tree is established.
- Water properly; too little or too much is harmful.
- Keep grass and annuals away from the new tree.
- Add amendments if soil structure is poor, but do not over-amend the soil.
- Do not wrap trunks or accept trees with wrapped trunks.
- Do not accept trees with flush cuts and wound dressing.
- Know the light requirements of your trees.
- Prepare a planting site, not just a small hole.
- Loosen the soil deep and far beyond the crown dripline.
- Remove only dead and dying branches and roots.
- Support, but not so rigidly that the tree cannot move.

No flush cuts

Pruning a branch by cutting it flush with the trunk or branch it arises from forces the tree to sacrifice large reserves of energy and considerable amounts of wood. Unfortunately, some tree care professionals and many books on pruning still advocate making flush pruning cuts.

Flush cuts and wound dressings stimulate large callus that rolls inward and prevents wound closure. Flush cuts start more than 14 serious tree problems.

Over-pruning causes weakening of roots and promotes root diseases.

Make pruning cuts as close as possible to the collar at the branch base, but do not injure or remove the collar.

Food stubs

Living or dead stubs are food for organisms that start rot and cankers.

Trees do not heal as people do, by regenerating damaged tissues. Instead, they sacrifice injured wood to protect the healthy. In the vicinity of a wound, trees activate storage cells. The cells convert their stores into compounds that coalesce around the wound and form boundaries that restrict the spread of diseases and insects. The isolated wound dies, but the rest of the tree lives on.

The best way to treat wounds is to prevent them in the first place. Wounds can be made by wire in hose bracing, lawn mowers and string trimmers.

If bracing is needed, use broad, belt-like strapping that will not cut into the bark. The tree should be able to sway slightly. Remove bracing after the tree is firm in the soil, one or two years at the most. *Do not use wire in a hose!*

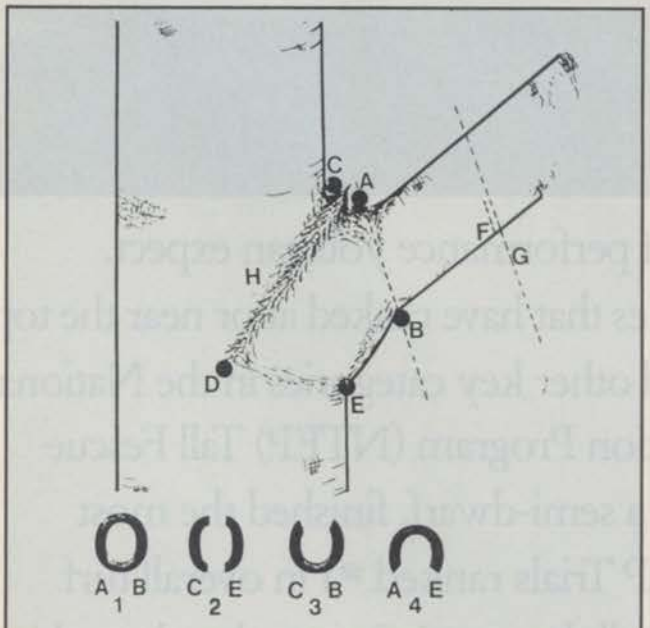
Tipping

Topping or tipping causes serious injuries to large trees and leads to hazardous conditions. Proper early pruning can regulate tree height and make later topping unnecessary.

If you think your mature tree needs topping, maybe you need a new tree, especially if it is under a power line.

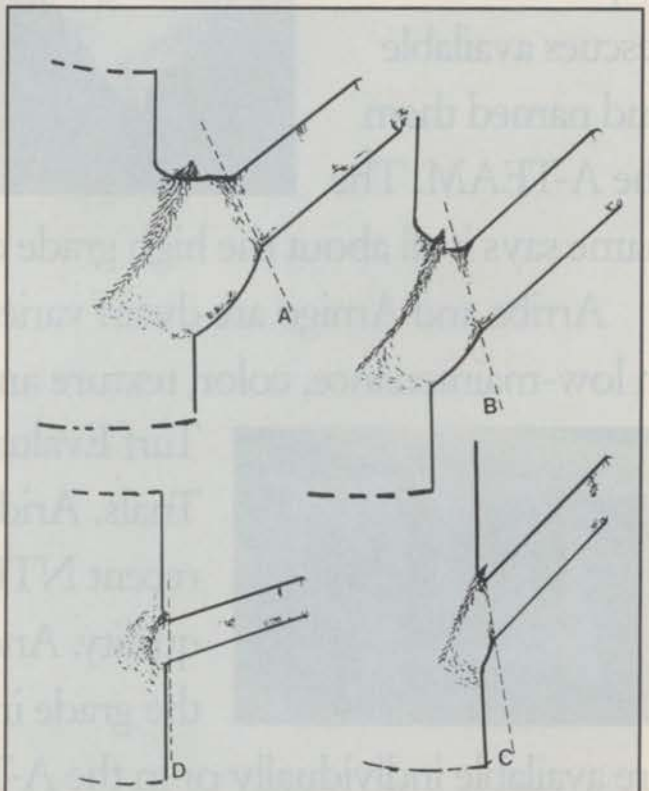
So do not plant trees under power lines, or plant only small-maturing species, or start pruning when the trees are small.

continued on page 52



NATURAL TARGET PRUNING

Locate the branch bark ridge (H) and the branch collar (E to B).
Stub cut the branch (up F, down G).
Locate points A and B where the branch meets the branch collar.
Cut from A to B, or from B to A with care.
If position of B is uncertain, draw a line in your mind from A to E.
Angle EAD is approximately the same as angle EAB.
Point D is the beginning of the branch bark ridge (H).
A proper cut will result in woundwood pattern 1.
Improper cuts will result in patterns 2, 3, and 4.
Do not leave stubs.
Do not make flush cuts.
Do not paint the wounds.



BRANCH COLLARS AND ANGLES OF CUTS

Proper pruning of a living branch is a cut as close as possible to the branch collar. There is no set angle for a proper cut.
Cuts A, B, C, and D are proper cuts.

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You could call their editorial and marketing teams "roadies," because they spend 50% of their time traveling to shows, tracking stories and getting candid perspectives from suppliers. Listed here is just a portion of the shows they'll be attending this year. Frankly, it's the only way to stay on top of late-breaking news and keep both books fresh and on the cutting edge of their market segments. This dedication makes them the authoritative voices on industry problems and opportunities readers need to be aware of...and explains why their competitors look like warm-up acts.

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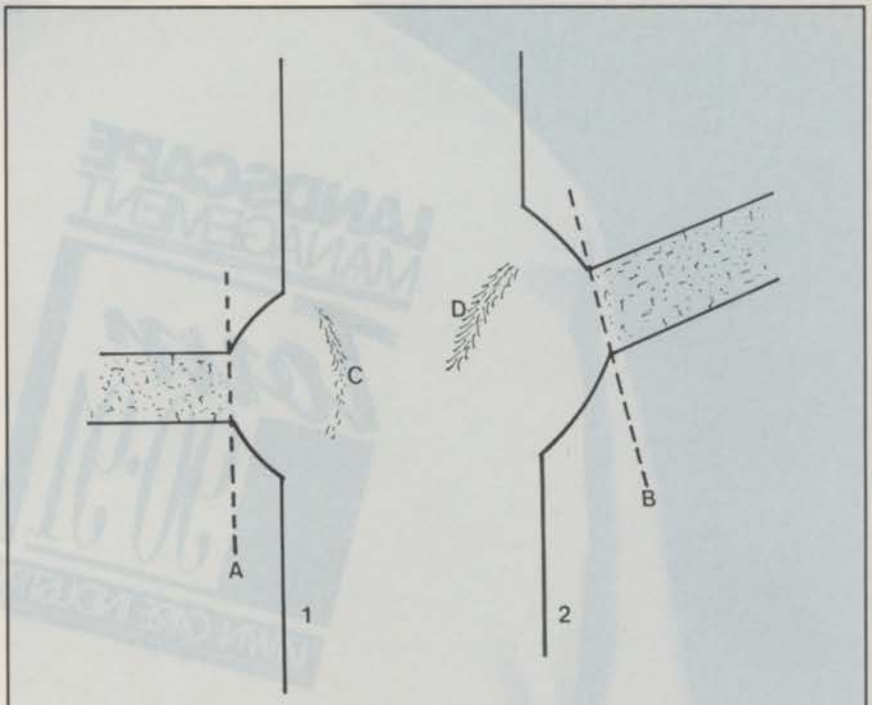

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To remove dead branches, make cuts as close as possible to the ring of sound wood about the branches; on conifers (1A) and hardwoods (2B). The branch bark ridges stop forming after the branches die (C and D). The ring of sound wood about the dead branches may be very large or very small and flat.

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Remember that dressings do not stop rot. Trees respond to wounds by forming boundaries. Boundaries defend the liquid transport, energy storage and mechanical support systems. Boundaries resist spread of pathogens into wood. After wounding, trees form another boundary that separates infected wood from healthy wood that continues to form.

Sometimes tree wounds stimulate the growth of woundwood, which may roll inward to form a "rams horn" and prevent closure. To treat wounds properly:

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Circle No. 144 on Reader Inquiry Card

BEYOND THE GREENS... WHY NOT REDS, YELLOWS, AND PURPLES?

Bedding plants add color and beauty around the golf course

by Kathy Zar Peppler

The many varieties of bedding plants available today provide landscape professionals with an artist's palette of rich colors and textures.

"With smart use of these easy-to-care-for plants, the traditional lush green golf course can be transformed into a spectacular canvas of color. All you need to create your own artistic masterpiece is your imagination, a little knowledge, and effective communication with your grower," explains Terry Numfeld, executive director of Professional Plant Growers Association in Lansing, Mich.

Bedding plants are particularly suited to enhancing the beauty of golf courses because of the instant, bright color they provide. "People respond emotionally to a large splash of one or several colors, and unexpected splashes of color strategically positioned throughout a golf course are especially appealing," Numfeld adds.

After incorporating 15 bedding plant species, 380 flats, and 22 beds into the landscape last year, Susan Crosley, staff horticulturist at the Findlay (Ohio) Country Club reports that long-time members often comment on their beauty. Susan's husband Clay, the club superintendent, adds, "For every compliment I got for the golf course, she got at least two. I kidded her that she stole the show."

While the club planted flower beds in the past, it was not until 1990 that the beds looked spectacular. Why? Because it wasn't until fall of 1989 that Sue and Clay began at the club.

The first thing Sue did was assess where the flower beds should be located. Three of the 22 beds were critical: the "circle bed" at the club's entrance, the "transition" bed between the club and tee, and the "logo" bed behind the 18th hole. It was important to Sue that these special beds would create just the right mood.

Annual flower beds used to enhance the beauty of at the Findlay Country Club include more than 2,520 annuals.

The circular bed

Because the circular drive to the club's entrance was highly visible and formal, Sue wanted to emphasize this theme in the circle beds. She did so by using 25 flats of one variety of a yellow marigold, 15 flats of white alyssums and five flats of red salvia in the 2,000-square-foot beds. "I wanted these beds to bloom continuously all summer long," explains Sue, "and I thought the yellow (the theme color) would be a nice contrast against the dark green yews."

She decided to use white alyssum to further highlight the yellow marigolds. In front of the foundation yews, Sue selected red salvia as yet another distinct and dramatic accent.

The easiest way to create a formal bed is by using annuals, one variety (one color). Somewhat low-growing, well-mounded species tend to appear more formal, such as fibrous begonias, tuberous begonias, geraniums, impatiens, New Guinea impatiens, French marigolds, petunias and vinca.

When a 2,000-square-foot bed is designed and one variety is used, it's important to allow for enough lead time for the grower to be able to grow the color required. When several colors are used in a bed, whether it be one or several species, it's a good idea to use at least two to three times as much of the darker color than of the lighter color.

Why? Because dark colors recede and light colors appear to pop out, providing a better balance.

When two colors of one species are used together (like hot pink and white impatiens) be sure the two colors are in the same series. A series is like the last name of a line of colors, such as 'Yellow Boy', 'Golden Boy', 'Orange Boy', and 'Harmony Boy' in the "Boy" series of marigolds.

continued on page 62

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Breeders develop colors (varieties) within a series to achieve similar traits, like plant growth habit, height, size of bloom and blooming period—for both greenhouse (pack) and outdoor performance. By choosing varieties within the same series, you won't be surprised to find one variety six inches and another 12 inches tall.

The transition bed

Another important bed, located between the clubhouse and No.1 tee, became known as the "transition bed." This informal 1,850-square foot shaded bed created an effective transition from the formality of the entrance to the natural setting of the course.

According to Clay, "The plants created a friendly, laid-back, relaxing atmosphere that added to the enjoyment of the game especially for those who are social versus serious players."

Early ordering makes it easier to remember what was ordered and how well each variety fared the season before.

Forty flats of mixed colors of begonias and 20 flats of mixed colors of coleus were used. Several reasons this bed appeared informal include:

- coleus looks natural, "woodsy;"
- mixed colors generally appear informal; and
- the bed was not designed in a rigid straight line, but instead portrayed a meandering effect.

Other ways to achieve an informal appearing bed might be to incorporate annuals among perennials. Or combine a number of species, colors, textures and flower forms together.

Some plants, like coleus, creeping zinnia, cornflower, gazania, rudbeckia, kochia, nicotiana, snapdragons and zinnias just naturally look casual.

To design a sun-loving informal bed, consider using canna lilies, spider flower or hibiscus in the background. Then incorporate a mixture of rudbeckia, African marigolds, nicotiana and/or ageratum in the foreground.

The 1000 bed

While bedding plants were strategically planted throughout the 170-acre course, the grande finale certainly became the logo bed placed near the last green.

Findlay Country Club horticulturist Susan K. Crosley, left, with Shirley Vlasich, FCC's women's club tournament champion, 1989 and 1990.

To create a final, spectacular visual image that members and guests will long remember, consider transplanting bedding plants to form your golf course or corporate logo. This approximate 10-by-20-foot bed was not only highly visible, but it achieved added interest of a 3-D effect by planting the letters in 25 flats of 18 inches tall red salvia with 10 flats of four-inch-tall white sweet alyssum for the background.

Use a spreading annual outside the lettering, such as ageratum, lobelia, low growing impatiens, cascading petunias or vinca. For a more rigid annual to form the letters, consider transplanting celosia, dahlia, dianthus, geraniums, marigolds, ornamental pepper or primrose. Note that some of these species are short and others tall, that some require cool and others hot weather, and that some prefer sun while others bloom best in part-shade.

Susan's dreams for a bigger and better 1991 are wholeheartedly supported by the country club's board of directors; her flower bed budget has been increased 50 percent.

Looking back

While many aspects of designing, transplanting and maintaining the 22 flower beds were thoroughly enjoyable, it was not always easy going for Sue. Here are some practical lessons she learned:

1. Start out small if: a) having flower beds is new to you, no matter how much of a horticulture background you have; b) this is your first year at the job site so you can learn more about the growing conditions,, watering systems, etc; c) you just moved from another part of the country; d) you don't have an automatic watering system.

2. Prepare the beds before the plants are to arrive so that when the plants do arrive, they can be planted right away.

3. Don't take more flats than can be transplanted within a short period of time, especially if you don't have an ideal location to hold over the plants.

4. Check the water and soil for pH. Check the soil for possible nutrient deficiencies and porosity.

5. Amend the soil several weeks before transplanting.

6. Avoid growing too many species for the first time. Here too, learn the idiosyncrasies of each species.

continued on page 64

20 Low - to - Medium Maintenance Annuals that can be grown almost anywhere in the country.

Species	Spacing	Height	Light	Moisure	Temperature
Ageratum	5-7″	4-6″	S,pSh	a-m	a
Amaranthis	15-18″	18-36″	S	d	h
Begonia, Fibrous	7-9″	6-8″	S,pSh,Sh	a	a
Celosia	6-8″	6-15″	S	d	h
Coleus	8-10″	10-24″	Sh,pSh	a	a-h
Dianthus	7-9″	6-10″	S,pSh	a	any
Dusty Miller	6-8″	8-10″	S,pSh	d	h
Geranium	10-12″	10-15″	S	m	a-h
Gloriosa Daisy	12-24″	18-36″	S	m	h
Hibiscus	24-30″	48-60″	S,Lsh	m	a-h
Impatiens	8-10″	6-18″	pSh,S	m	a
Impatiens New Guina	10-12″	10-12″	S,Lsh	m	a
Marigold, French	3-6″	5-6″	S	a	a
Ornamental Pepper	5-7″	4-8″	S,pSL	m	a-h
Petunia	10-12″	6-12″	s	d	a
Portulaca	6-8″	4-6″	s	d	h
Salvia	6-8″	12-24″	S,pSh	a-m	a-h
Spider Flower	12-15″	30-48″	S	d	a-h
Sweet Alyssum	10-12″	3-5″	S,psh	a-d	a
Vinca	6-8″	12-24″	S,pS	any	h

Light: s = sun; sh = shade; pSh = part Shade; Lsh = light Shade

Moisture: a = average; d = dry; m = moist

Temperature: a = average; h = above 85°F; c = below 75°F

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7. Before growing a large bed of a species and possibly a variety that has not been grown in the area before, try it out on a small scale in a inconspicuous area.

The Professional Plant Growers Association offers these suggestions:

- Communicate your needs to your growers.
- Tell your grower the dates you want the bedding plants and how they are to be transported.
- If you require specific varieties and/or cells per flat or pot sizes, make this clear when ordering the plants.
- If you are not certain which species or varieties will do best in the location intended, ask your grower for advice. They are very knowledgeable and can provide valued suggestions.
- Order early. Most successful landscapers place their orders between July and early November. One advantage to early ordering is it's easier to remember what was ordered and how well each species/variety fared the season before.
- Whenever shipments arrive, "take stock" immediately. Report any damaged or missing plants immediately. Your grower, like you, wants your order to be right.
- Water the plants right away to reduce transportation stress.
- Locate the plants in a somewhat shaded area away from strong winds until they can be transplanted.
- Keep in mind the standard "formula"—that one person can plant approximately 25 flats per day—to help determine the number of people needed to transplant the bedding plants as soon as possible after delivery.

(To obtain a comprehensive booklet about annual bedding plants and ideas for their use in the landscape, order "The Professional Guide to Flowering Annuals." This 28-page book is available through the Professional Plant Growers Association, P.O. Box 27517, Lansing, MI 48909. It contains useful design ideas, plus charts outlining planting, spacing and herbicide tolerance of most bedding plant annuals.

Include your address and a check for $2 when ordering.) **LM**

Kathy Zar Peppler is a horticulture public relations consultant and writer for Yoder Brothers, Inc. and the Professional Plant Growers Association. With 21 years experience in the horticulture field, she has managed one of the largest garden centers/florists in the country, was the national spokesperson for the gardening and interior landscape/floral industries and was the executive director for All-America Selections.

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Circle No. 113 on Reader Inquiry Card

SURVIVING IN A TROUBLED ECONOMY

In Part One of a four-part series, our green industry analysts reveal what it takes to stay on top in a time of increased competition and economic recession.

by Ed Wandtke and Rudd McGary, Ph.D.

Survival.

In the business world, this word conjures up a scenario of economic doom and gloom. In the green industry, however, survival has more to do with keeping up with change and competition than fluctuations in the Dow-Jones. So while this series of articles is driven, to some extent, by the economic conditions that we are likely to encounter in the coming years, it's important to note that there are other important factors to take into account when discussing survival in the 1990s.

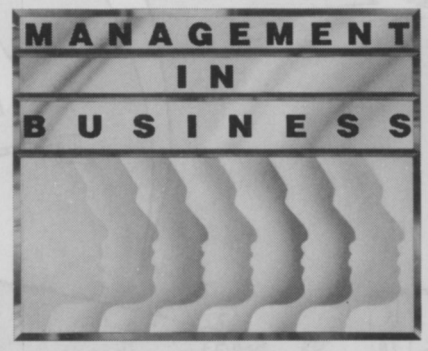
Numerous standard economic indicators today point toward an oncoming recession. We believe it's more realistic to think of the upcoming economic period as a slowdown—not a full-blown recession. The result of this slowdown will be that consumers will become more selective about what they buy and how often they buy it. Consequently, the next 18 to 24 months will be a time of opportunity for the well-run company and a time of disaster for companies that are managed poorly.

Where to look

In a slow, even downward-spiraling economy, one of the first areas to lose consumer support are auxiliary services, which include the landscaping and lawn care industries. Companies that have targeted upscale accounts are less likely to be affected by a slowed economy and will fare better. Therefore, your marketing efforts should be geared toward residential and commercial accounts that are somewhat insulated from a slowing economy.

Another area of concern in a turned-down economy is your productivity. Many companies run "fat" during prosperous times yet don't realize it until more difficult times emerge. Managers should be aware of the numbers needed to run the organization and how to manage them.

The professional landscaper can do little to stem the tide of a slowing



economy, but factors closer to home may be impinging on your profitability. For example, in many markets there is a preponderance of landscaping firms, causing market saturation.

Saturation strategy

Saturation explains why we're now seeing larger firms buying accounts from smaller companies rather than pursuing additional marketing efforts. In some areas, it's cheaper to buy companies than to launch a marketing campaign.

In saturated markets, survival is a way of life. It doesn't matter if the economy is up or down; there is so much competition that every day is spent just trying to get by. Low-balling is a common practice for these organizations. Good companies don't need to sink to this level. They realize that in the long run, low-balling will lead to nothing but problems.

Long-term growth in a saturated marketplace depends on sound management, marketing and operating decisions. Mistakes like cutting essential budget items, inaccurate pricing, or laying off important personnel will have disastrous consequences for a firm trying to survive stiff competition.

Follow trends

Lastly, green industry companies battling for survival need to remain aware of where the industry is headed. For example, a recent trend in the industry has been the move toward multiple service offerings. Many prudent, aggressive companies carefully chose those services it can provide profitably.

If you bring on a new technician who happens to be skilled at tree service, why not begin marketing that service to your customers? A lot of companies do this with a variety of combinations.

A common pitfall is when service combinations don't make sense to the consumer. Make sure your service mix reflects the consumer's wants, then deliver each in a manner that leaves room for profit.

Remember that surviving in the 1990s goes beyond worrying about the state of the economy. A slowdown is only natural, and there's nothing you can do about it. Use the opportunity to take a closer look at your organization and find ways to do what you do leaner and better.

In upcoming articles, we'll focus on strengthening your marketing efforts, operations and budgets. It is our intent to not only help you surive what may be lean years, but to actually grow in spite of them. **LM**

Next month: survival marketing

Ed Wandtke and Rudd McGary, Ph.D., are senior consultants with AGMA Inc., Columbus, Ohio. Wandtke focuses on operational and financial questions, while McGary is a marketing specialist.

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QUICKIE-QUIZ

Weed reduction and control

Common Weeds in Turfgrass **Common Weeds in Turfgrass**

Bunch Broadleaf	*Spreading Broadleaf*	*Annual Grassy*	*Perennial Grassy*
Dandelion[1]	Chickweed	Crabgrass[1]	*Poa annua*[4]
Plantains[1]	Knotweed[1]	Goosegrass[1]	Tall fescue[2]
Others	Henbit[1]		Nimblewill[2]
Wild garlic[3]	Speedwell[3]		Quackgrass[2]
Nutsedge[2]	Spurge[1]		Dallisgrass[1]

[1] Controlled by annual application of herbicides.

[2] Glyphosate kills weeds and turf.

[3] Requires repeated treatment. Underground bulbs make control difficult.

1. Weed control is most effective when done in:
- a) September and October
- b) mid-summer
- c) late spring
- d) early June

2. Apply herbicides:
- a) one day prior to mowing
- b) immediately after mowing
- c) 24 hours after mowing
- d) timing is not important

3. Weed elimination becomes evident within:
- a) three days
- b) one week
- c) two to four weeks

4. Crabgrass thrives well during:
- a) mid-summer, when hot and dry
- b) mid-spring, when warm and rainy
- c) late fall, in cooler temperatures.

5. Two applications (5-7 days apart) of organic arsonates can selectively kill: (multiple answers)
- a) crabgrass, goosegrass, chickweed
- b) *Poa annua*
- c) sandbur, barnyard grass and foxtails
- d) lovegrass and nimblewill

6. In warm winter areas, *Poa annua* germinates during:
- a) June and July
- b) October through May
- c) August and September

7. Name the weed pictured below:
- a) nutsedge
- b) spotted spurge
- c) speedwell
- d) common chickweed

8. Aquatic weed treatment is most effective during: (multiple answers)
- a) very early May in southern areas
- b) August, when in full bloom
- c) very early June in northern areas

ANSWERS

1)a; 2)a; 3)c; 4)b; 5)a.c; 6)b; 7)c; 8)a.c

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Circle No. 108 on Reader Inquiry Card

Sugar maple a good source for cultivars

by Doug Chapman, Dow Gardens

The sugar maple (*Acer saccharum*) is proving to be a fruitful tree species for introduction of new cultivars.

Reasons for this can be found by examining the tree's range, characteristics and cultural requirements. The native range of sugar maple is from New England to Minnesota and south to North Carolina and Georgia. For a species with such a large native geographic range, points of origin are numerous.

Generally, the farther north the plant is native, the more responsive it will be to photoperiods. Further, it will have more spectacular fall color. New England sugar maples develop red and scarlet fall color. Michael A. Dirr reports native *Acer saccharum* from Southern Illinois develop golden-yellow fall foliar color.

***Acer saccharum* shows lime-green spring leaves and dark green summer foliage, as well as the spectacular scarlet, red, and yellow of fall.**

Acer saccharum is known for its lime-green spring leaves and dark green summer foliage, as well as the spectacular scarlet, red, and yellow leaves it exhibits during fall. It is not uncommon for all three colors to be present on a single large specimen, but a single color will predominate.

The sugar maple's upward oval growth habit is usually quite uniform. It will reach a height of 100 feet, with a landscape effective height of 60 feet.

The sugar maple is propagated by seeding, cuttings, and budding. Seeding is quite common for native plants, but when one is trying to propagate clones, budding or cuttings should be considered. With cuttings, you are using the original root system, there is no incompatability, and uniformity remains. Since most cultivars

continued on page 74

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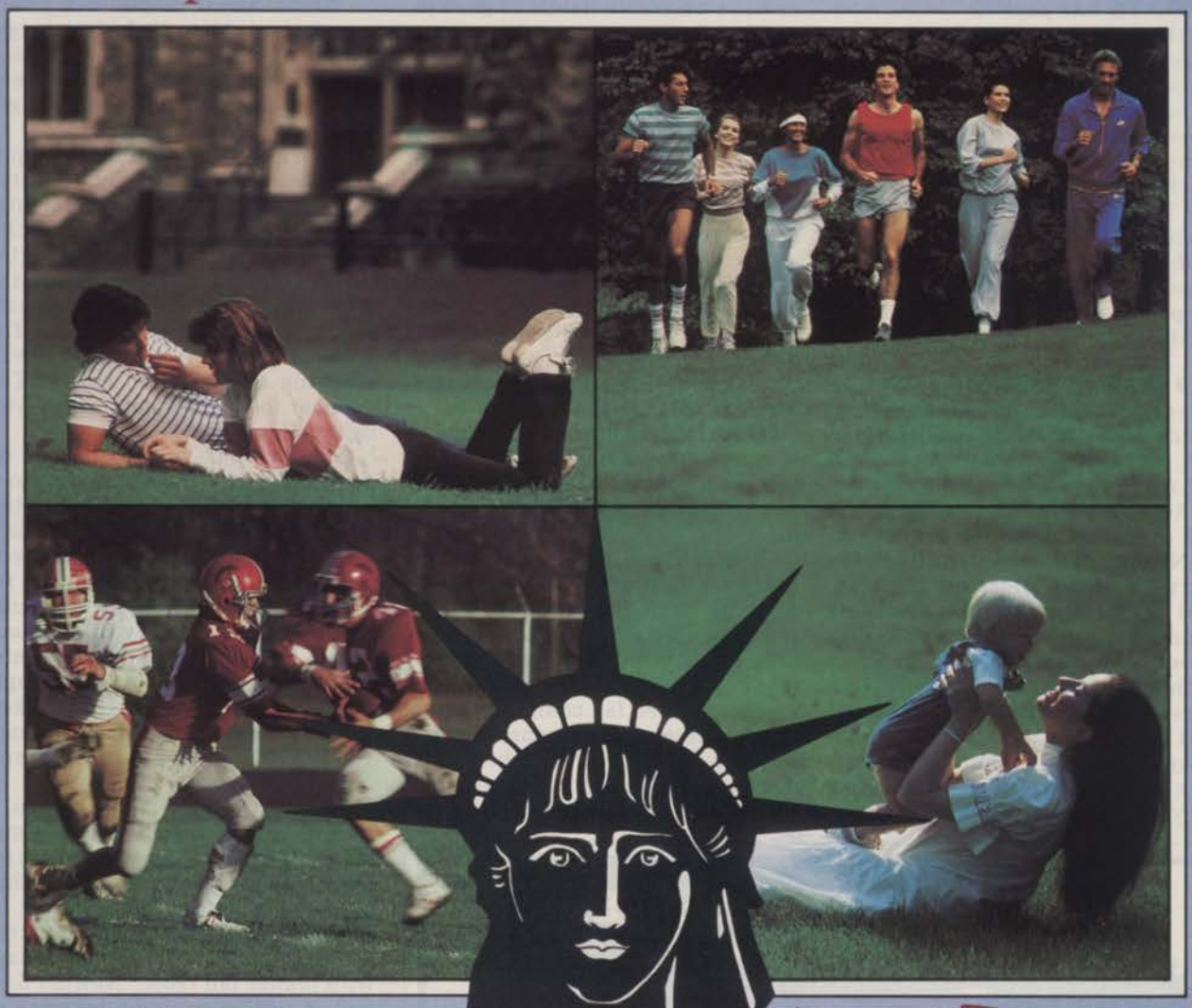

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UPDATE *from page 72*

be they chance selections or purposeful hybrids—are selected as a whole plant, it does not make sense to bud them on rootstocks of unknown phenotypic influence or inappropriate provenances. Rootstocks of inappropriate provenances can lead to lack of hardiness or incompability (in congeniality). This problem has been documented for trees that have a large native geographic range, like *Acer rubrum* cultivars.

Use large, well-drained sites

The sugar maple is a climax forest tree which grows in fertile, well-drained soil, yet is shallow rooted. A pH of 5.5 to 6.5 is optimal.

Acer saccharum is slightly tolerant of sulfur dioxide, ozone and PAN. It needs a large planting site to thrive, and is perfect for commercial landscapes, parks and golf courses. It is not well suited as a city street tree unless planted in areas with ample outlawns. Sugar maple is sensitive to chlorides, thus road salt. Further, it is sensitive to poorly-drained/compacted soils. The cultivars are selected because they will grow in unique conditions or have desirable habits of growth.

The 'Commemoration' sugar maple (introduced by Wandell) reaches a height of 40 to 50 feet within 30 years. It has an upright oval growth habit, and it develops a heavy dense crown with dark green summer foliage and red to orange fall color. The leaves are reported resistant to leaf tatter.

A look at the cultivars

The 'Endowment Columnar' sugar maple (introduced by Siebenthaler) develops a landscape effective height of 40 to 50 feet and a width of 10 feet. The fall color of the Endowment is yellow to red, indicating a somewhat southern provenance. 'Endowment' has been reported resistant to leaf scorch, making it a street tree candidate.

The 'Fairview' sugar maple was introduced by the McGill & Son Nursery. Its habit is broad and round, reaching a height of 40 feet. It maintains a strong central leader. The summer foliage is dark green with yellow, orange, and red fall color developing in mid autumn. Nurserymen report a fondness for the 'Fairview' because it developes caliper more rapidly than the species.

'Globe' sugar maple is a small, round plant, 10 to 12 feet in height which has a place in commercial, street, or home landscapes. The green summer foliage yields to a bright yellow color in the fall.

'Green Mountain' or black maple, was introduced in 1964 by Princeton Nursery. It is tolerant of compact soils, and exhibits little leaf scorch. Michigan municipal foresters have reported 'Green Mountain' sugar maple the most important drought tolerant-street tree sugar maple cultivar. The habit of growth is an upright oval, reaching 40-45 feet in height. The summer foliage is a dark green with light yellow fall color.

'Legacy' sugar maple has been reported to have a dense, heavy crown reaching 50 feet in height. It was introduced in 1983 by Willet N. Wandell. The fall foliage is a bright yellow to orange and red some years. Dirr reports it to be superior in the south, while Kluck's Nursery in Saginaw, Mich., feels it is dependably winter hardy and one of the best sugar maple cultivars for the eastern Great Lakes. It is well suited to commercial landscape, park, and/or golf course plantings.

'Newton Sentry' sugar maple, a columnar tree, is two to three times taller (30 feet) than its width. This selection, found in Newton, Massachusetts, has a strong central leader. Its best landscape use is in restricted areas. It has green summer foliage with orange fall color. 'Newton Sentry' is not as drought tolerant as 'Green Mountain.'

'Goldspire' sugar maple is a pyramidal tree, reaching 40 feet in height. The summer foliage is a light green with yellow fall color. It is reported resistant to leaf scorch but not as resistant as 'Green Mountain.' 'Goldspire' seems adapted to street tree or low-maintenance use in parks.

'Seneca Chief' sugar maple is an introduction of Schichtel Nursery. It is a dense upright oval tree, reaching 50 feet in height and 20 feet in width. The green summer foliage will yield to a bright orange leaf. It is a northern provenance, being hardy to Zone 3.

'Monumentale' sugar maple is a narrow, upright tree (40 to 50 feet). When young, it is very narrow and upright with a central leader. As it matures it develops a vase shape. The fall color is a bright orange.

Good references on maples are: Michael A. Dirr's *Manual of Woody Landscape Plants*, 1990, Stipes Publishing; and Willet N. Wandell's *Handbook of Landscape Tree Cultivars*, 1989, Horticulture Research Institute. **LM**

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Golf course superintendents and lawn-and-landscape managers depend on Bensumec™ 4 LF because it's the *one* pre-emerge that they can trust to get poa annua, crabgrass and other grassy weeds. Spontaneous emulsification assures easy mixing with any Trimec® Complex; Ferromec® AC Liquid Iron; Embark® Plant Growth Regulator; and high-nitrogen liquid fertilizers.

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Turf colorant keeps grass 'summer' green

The most orthodox of turf professionals might shudder at the thought, but turf colorants are often used to brighten dormant or water-starved turf, or as a supplement to overseeding.

If you're wondering whether paint will injure the turf, fear not. Turf paint has long been one of the tricks of the athletic field and golf course management trades, and is mentioned in *The Turf Manager's Handbook*, by W.H. Daniel and R.P Freeborg (1987, Harcourt Brace Jovanovich).

The following is a look at three turf colorants on the market.

Green Graphics colorant brightens up the fairways at the Tucson National Golf Course in the dry, arid Arizona climate.

The grass still grows

Jim Wellborn of Green Graphics, Alburquerque, N.M., assures golf course superintendents that his Green Graphics paint does not affect the turf's life cycle. In the spring, the original turf will re-emerge from dormancy.

"If you were to examine the grass cuticle as it begins to grow again," says Wellborn, "you'll probably see that the grass is growing out of the paint, at the bottom and the top. Because of the deep green color imparted by the coating, the sun's rays will more rapidly raise surface temperatures to stimulate earlier growth, as much as three to six weeks earlier than usual."

Can't tell the difference

Mike Petty, superintendent of the Tucson National Golf Course, has used the Green Graphics product, and says it does indeed closely resemble natural turf.

"If you overseed," says Petty, "and it doesn't come out to your liking, you can just go in and paint over the top, thereby painting the dormant bermuda that shows through the overseed."

Turf paint also comes in handy if you're behind on your seeding schedule.

"If you have to overseed late," explains Petty, "you can paint over the top of the overseed before it germinates, giving you the dark color and the heat absorption.

"In painting the dormant bermuda," Petty remembers, "we had a quicker green-up than any of the other courses."

The W.A. Cleary Co., Somerset, N.J., markets the Grass Greenzit colorant. According to Bron Zienkiewicz, director of marketing and development, Greenzit can be used on all types of turf, for dormant, browned-out turf or turf discolored from mis-application of herbicide or fertilizer.

Varied dilution ratios

Colorants can be easily diluted to achieve the desired color. "We recommend 4 to 10 ounces per gallon of water for discolored grass, 10 to 18 ounces for dormant grass," explains Zienkiewicz.

With the paint's dark green color, the sun raises temperatures to stimulate the growth of dormant grass.

Dilution ratios are often altered for application to different species of grasses. On bentgrasses—which are often used on golf greens, and which become only slightly discolored from winter cold—Wellborn says a Green Graphics application of a 40:1 maximum dilution is often all that is necessary to bring natural color back to the grass.

Landscape managers experienced with colorants may require a minimum 10:1 dilution ratio on totally dormant grasses with Green Graphics. The most often-used ratio of dilution is 20:1.

Zienkiewicz says low rainfall in California has made Greenzit especially popular in that state.

Use on thirsty turf

Drought stricken golf courses or neighborhood lawns can at least "look good" with colorants. "A number of golf courses and consumers have used it on their lawns because of water restrictions," says Zienkiewicz. "It's good for a tournament spruce up, and can also be mixed with sand to fill divots".

Cleary recommends using its colorant only when the temperature is above 40°F and when no immediate rain is anticipated.

When using any colorant, avoid spraying on windy days, and wash out spray tanks immediately after use.

Athletic field applications

Green Lawnger is a colorant from Becker-Underwood of Ames, Ia. Company president Roger Underwood says Green Lawnger is a latex-formulated, water-base paint that is suitable for any species of turf. According to Underwood, Green Lawnger is primarily used by sports turf and lawn care professionals.

"Sports turf people appreciate our product because it is a flexible coating," says Underwood. "When the field is in high use, the coating will hang on to the turf better; it won't become brittle and fall off."

Green Lawnger was recently used at last summer's World Cup soccer tournament in Italy.

Recommended use rate is one gallon per 10,000 sq. ft. **LM**

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These Pros Know A Great Bentgrass When They See It.

It takes a real professional to recognize the benefits of a superior turfgrass. These superintendents are pros at growing grass. Their expertise is invaluable in evaluating new turfgrass cultivars. So when we developed Providence and SR 1020 we went straight to them. We realized that university data was useful but that evaluation by outstanding superintendents under varied golf course conditions was more important.

These superintendents have all used Providence and/or SR 1020. Their comments have been enthusiastic about the performance of both cultivars: the color, texture, density, disease resistance, and heat and drought tolerance are outstanding.

Providence and SR 1020 also produce excellent putting quality. That's important to the superintendent and to the golfer. Especially, a professional golfer like Ben Crenshaw. Ben knows golf greens and appreciates a bent that can provide a fine textured, uniform surface with an absence of grain for true putting quality.

Both cultivars produce this outstanding turf and putting quality with reduced maintenance. That's important to superintendents, golfers, architects, and greens committees.

So nationwide the pros agree, Providence and SR 1020 really are exciting new cultivars. They represent the new generation of creeping bentgrasses.

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PRODUCTS

New computer software uses a "team approach"

Superscape landscape management information systems is a new software package specifically designed for the landscape industry.

For use with MacIntosh hardware, Superscape can analyze customers, locations and contracts, and analyzes the profitability of a customer relationship as a whole.

Superscape examines all costs tied to the actual contract, accounting for the small, billed-for extras associated with the contract, and factoring in the impact of larger, temporary jobs such as tree planting. It studies all direct variable expenses associated with a location. With a team accounting function, a manager defines his crews for the program, which in turn allows the tracking of all income and expenses associated with the crews. Team accounting allocates resources among various teams when those resources are shared.

Other functions include bid management, work orders, invoicing, accounts receivable and payable, cash management and purchase orders, time cards and shop management.

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Hydraulic seeder/mulcher can eliminate downtime

Gras Hydraul Super-Mulchers are made with total hydraulic power units to eliminate clutches, belts, chains and other breakable parts.

Gras says the feature provides dependable high efficiencies, greater flexibility, and peak performances on field applications ranging from the

roughest mine reclamations, to establishing fine turf and lawn areas.

Standard features include working capacities from 1000 to 3000 gallons, Cummins diesel power, full variable speeds, built-in safety bale breaker bars.

Agitation provides for quick dispersion of solids, and the pump unit manages the heaviest slurries.

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Topdress after aeration, enhance thatch breakdown

The Olathe Model 23 Topdresser is a tow-behind unit that can be pulled by most utility vehicles and tractors.

The ground powered hydraulic drive used for the unit reduces maintenance problems caused by chains,

sprockets and drive mechanisms used by other topdressers.

The unit's 60-foot swath distributes the topdressing using a high-speed rotating brush to propel it to the base of the turf.

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mph. The 23.5 cubic foot hopper has an infinitely variable metering gate from closed to three inches.

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Golf car shows off hill climbing ability

Columbia ParCar dealers successfully demonstrated the golf car's hill climbing ability during the company's International Dealer Meeting.

The scene was Devil's Head Lodge in Merrimac, Wisc. The hill was the

Number 3, which has a 28 percent grade of slope.

Columbia reports that the ParCar climbed the hill "effortlessly." Secret to the climbing power is the two-cycle engine built in Deerfield, Wisc.

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New turf utility trucks are tough and capable

Jacobsen has introduced two rugged new utility trucks.

The Model 2315, with its 23.5 horsepower liquid-cooled engine, and the Model 2015, with a 20 hp gas engine, can haul 1500 pounds, with a 19

cubic foot cargo capacity. Talilgate removes for unloading.

The Jacobsen trucks have a five-speed transmission with reverse. Top speed is 20 mph. A welded steel frame, large front bumper and heavy-duty drive train make them durable.

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Briggs & Stratton has added the new and advanced 12.5 hp I/C quiet engine to its industrial/commercial line.

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Briggs & Stratton says the unit is

"synchro-balanced" to reduce vibration. It also has a mechanical governor, for additional power in heavy mowing conditions.

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Utility vehicle modified with fiberglass cab

Cushman's GT-1 utility vehicle now has a new fiberglass cab for operator security and protection against weather.

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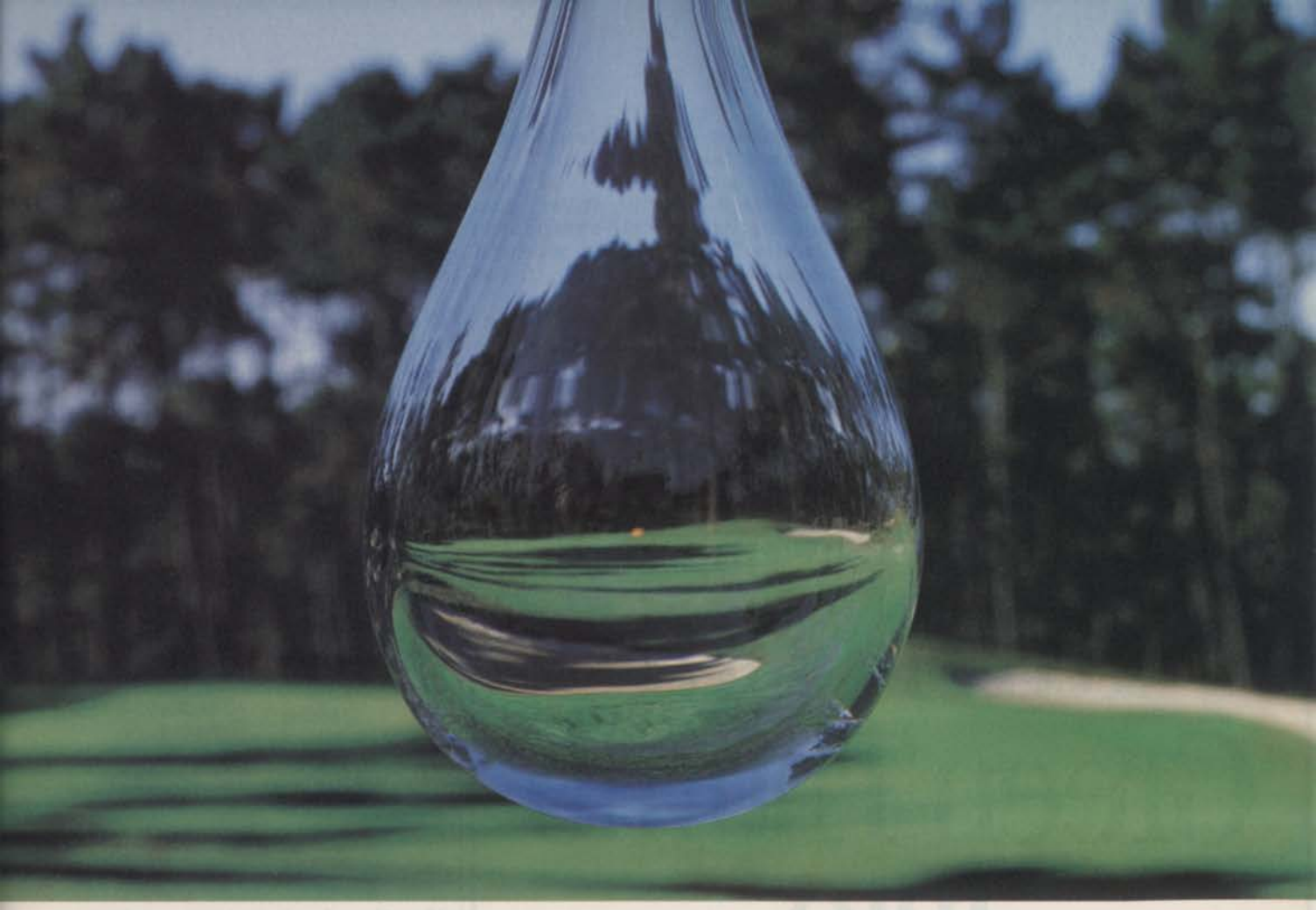

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centive program for buyers of selected products, January 1-March 31.

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Models 251K and 260K feature the Turbo Shredder mower deck. When combined with the Bac-Pac attachment, they make a complete multi-season turf maintenance machine.

The Excel "Accessory Package" contains the Hustler Edger Attachment and Rear Weight Kit.

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A "Maintenance Package" includes normal maintenance items such as belts, filters and blades, and the Rear Weight Kit and Seat Armrest/Backrest Extension Kit for greater operator comfort.

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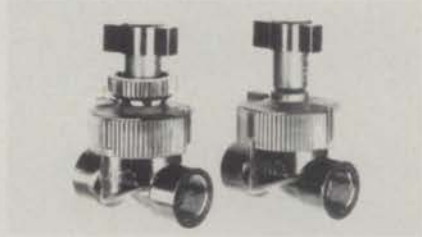
The Flo-Pro features the Toro QuickLind wireless solenoid, which enables the controller wires to be slipped straight into the solenoid for an instant connection with complete integrity. A waterproof gel inside the cap surrounds the contacts, eliminating the need for wire splices and watersealing.

Toro says the Flo-Pro has an encapsulated solenoid, with the plunger and other critical parts contained inside, so springs, screws and O-rings can't pop out.



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Meeting features newest vehicle line improvements

Club Car's recent dealer meeting provided the company an opportunity to intorduce its new line of work vehicles.

Included in the product line-up are the Carryall I and Carryall II Pickup, Carryall I and Carryall II Flatbed, the Carryall II Plus, and the Tourall. The new features include the front cowl manufactured in

new, more flexible, more durable and easier to repair material.

An improved fresh air intake system has been added to the gas models.

A new gravity tilt bed on the Carryall I and the tilt bed with optional hydraulics on the Carryall II will make unloading easier.

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Bio-fertilizer rebuilds soil's biological productivity

TurfTech II—from Soil Technologies Corp.— is a microbial bio-fertilizer

continued on page 84

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We've always believed that if we made good trucks, word would get around. And that's what's happening, if our rankings in recent J.D. Power and Associates surveys are any indication. This year, for the fourth time in the last five, our entire line of trucks ranked number one in customer satisfaction.*

And Mazda received the award for most trouble-free compact truck line in America for the second straight year.** We think that's a pretty good indication of what you, as a fleet operator, can expect from Mazda.

Choose from a complete range of models, 2- and 4-wheel drive, and a choice of engines to suit any purpose. All with standard features like confidence-inspiring rear anti-lock brakes. And all backed by our 36-month/50,000 mile, no-deductible, "bumper-to-bumper" warranty–one of the best basic warranties† in the truck business.

To get the lowdown on the complete line of tough, reliable Mazda trucks, call our National Fleet Sales office at (714) 727-6453. As you'll quickly see, your business can benefit from choosing Mazda. Because only our reputation precedes us.

*J.D. Power and Associates 1986, 1987, 1988, 1990 Light Duty Truck Customer Satisfaction with Product Quality and Dealer Service.SM **J.D. Power and Associates 1989 and 1990 Compact Truck Initial Quality Survey.SM Based on owner reported problems during the first 90 days of ownership. †Contact the National Fleet Sales Office for limited-warranty details.

mazda
IT JUST FEELS RIGHT.

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Circle No. 133 on Reader Inquiry Card

PRODUCTS *from page 82*

which offers a comprehensive program for managing soil fertility.

TurfTech consists of dormant microorganisms in a wettable powder, and can be used with any type of grass to enhance the soil-plant relationship. When applied to the soil, these legume-like microbes begin producing organic compounds which include nitrogen from nitrogen fixation, polysaccharides, organic acids and plant growth stimulating hormones.

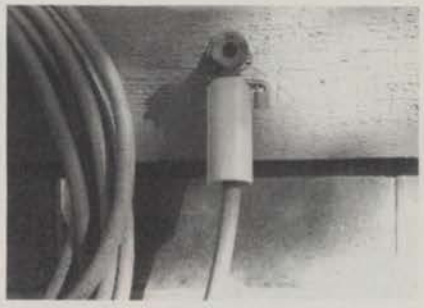
TurfTech II is described as an ideal seedbed preparation, either on bare soil, newly established turf or for overseeding and hydroseeding.

Circle No. 202 on Reader Inquiry Card

Hoses stay put with new locking device

Parker's Safe-Hose is an easy-to-use, two-part hose attachment to guard against hose theft and unauthorized water use.

Safe-Hose is made of durable plastic, and is secured with any standard padlock. Fits any standard faucet and



hose. Padlock not included.

Circle No. 203 on Reader Inquiry Card

New impact sprinkler made to be extra durable

Rain Bird Sales, Agri-Products Division has introduced the L36, a 3-4 inch impact sprinkler. The sprinkler has been redesigned with many improvements so important to the pivot market. The body is manufactured of Valox for added strength. Arms are

made of Delrin for long lasting wear.

A front counterweight has been added to reduce arm strokes, resulting in less wear and longer life.

Circle No. 204 on Reader Inquiry Card

Turn unwanted by-products into organic fertilizer

Harmony Products now offers the professional lawn care industry an alternative, environmentally sound, high-performing lawn fertilizer and turf builder.

Harmony's lawn fertilizer is made primarily from poultry by-products and is enhanced with synthetic nutrients. This mixture combines the advantages of organic and synthetic ingredients to produce a product that is both agrinomically and environmentally sound. The fertilizer's chemical makeup is 14-3-6.

Harmony says its fertilizer produces an initial green-up, increases soil microbial activity and moisture holding capacity, and provides valuable soil micronutirents. Over time, it will rebuild the quality of existing soil, leading to better turf with less chemical inputs.

Circle No. 205 on Reader Inquiry Card

continued on page 90

Say hello to Exmark's

Floating deck performers.

Large-deck productivity plus a smooth, beautiful cut can be yours with an Exmark Turf Tracer,™ Turf Ranger™ or Explorer.™ Unique floating decks glide over uneven terrain for a perfect cut that will make you proud. We invite you to ask your dealer for a demonstration and experience all the advantages of Exmark's floating deck performers. For the dealer nearest you contact Exmark:
402/223-4010

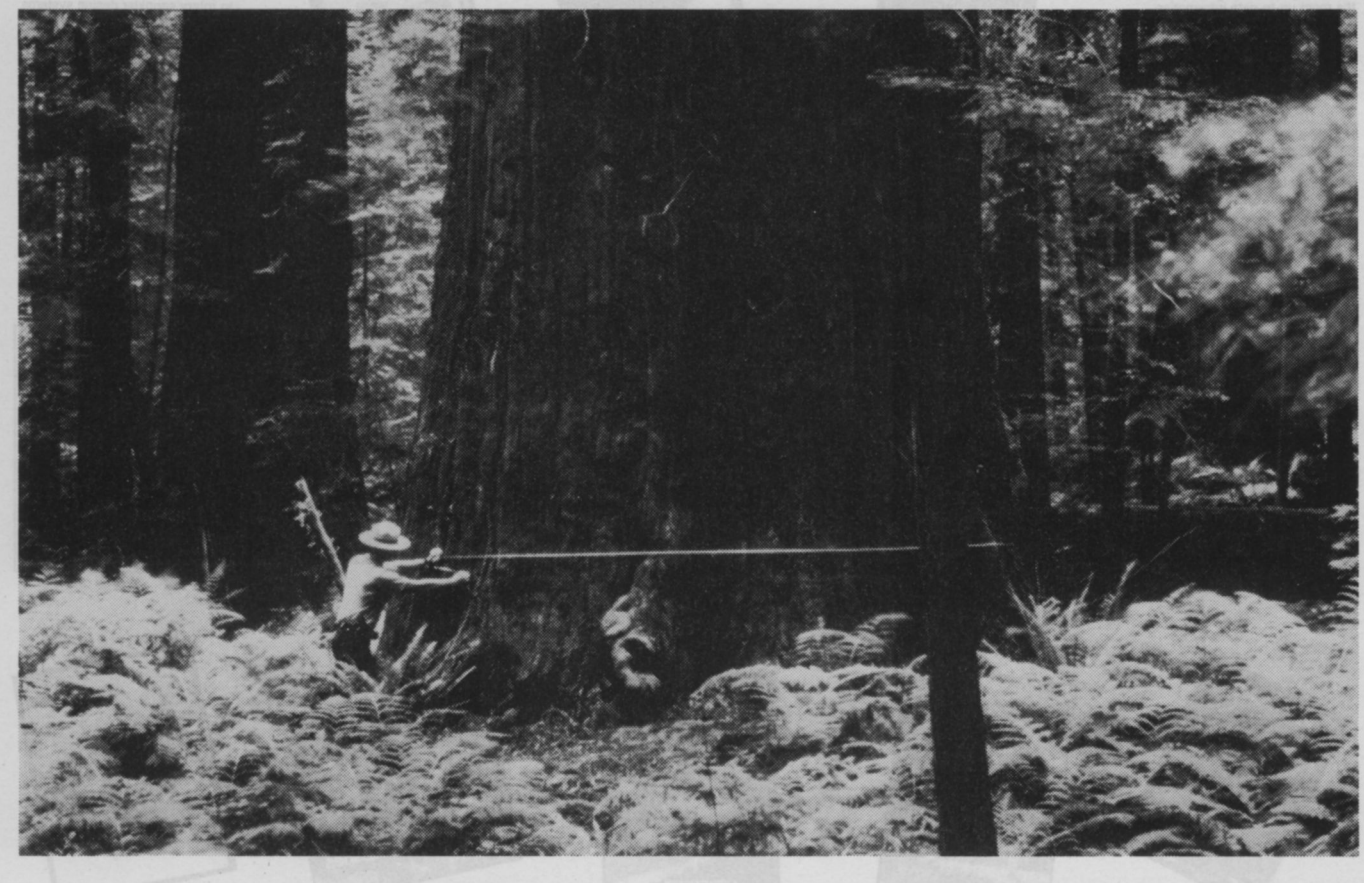
eXmark MFG. CO. INC.

Experience an Exmark.

Industrial Park NW, Box 748, Beatrice, NE 68310 FAX: 402/223-4154

Circle No. 160 on Reader Inquiry Card

Recognize America's Living Landmarks



From the towering 275-foot Giant Sequoia in California's Sequoia National Park to the relatively diminutive 20-foot Allegheny Plum in Virginia's Blue Ridge Mountains, America's living landmarks are an invaluable part of our nation's natural heritage.

That's why the American Forestry Association began The National Register of Big Trees in 1940. Today, as then, we encourage citizens across the country to find and recognize the largest tree of each species. With your help and participation, we can locate and protect these champions for future generations while fostering a deeper appreciation for trees and forests everywhere.

For information on how to measure and nominate a Big Tree, write: The National Register of Big Trees, American Forestry Association, P.O. Box 2000, Dept. BT, Washington, DC 20013.

America's Living Landmarks. Their preservation is every American's concern.

THE NATIONAL REGISTER OF BIG TREES

BOOKSTORE

010 - ADVANCES IN TURFGRASS PATHOLOGY
by Joyner and Larsen
Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial and field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **$27.95**

220 - CONTROLLING TURFGRASS PESTS
by Shurtleff, Fermanian, Randell
New comprehensive guide provides the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest. **$48.95**

230 - LAWNS-Third Edition
by Dr. Jonas Vengris and Dr. William A. Torello
Designed as a textbook or a practical usage manual, this book has been completely brought up-to-date. Care of lawns and turfgrass, from selection of varieties to maintenance of established grass is completely covered. **$27.95**

235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS
by H. Decker, J. Decker
Written by turfgrass professionals, this handy guide will be invaluable for playing field managers, golf course managers, or any lawn care practitioner. Covers all aspects of turfgrass management. **$48.95**

640 - TURF IRRIGATION MANUAL
by James Watkins
A guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters devoted to rotary sprinkler design systems. Golf course design systems and expanded engineering and reference material. **$28.50**

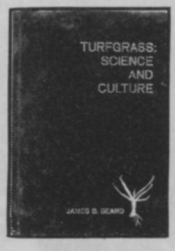
615 - TURF MANAGEMENT FOR GOLF COURSES
by James Beard
Written by an eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide. Details all phases of golf course design and construction, turf management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. **$68.00**

620 - TURF MANAGEMENT HANDBOOK
by Howard Sprague
Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **$26.60**

225 - TURFGRASS MANAGEMENT
by A.J. Turgeon
Revised edition. Covers the latest developments in turfgrass science and technology. Heavily illustrated with dozens of new drawings. Provides specific recommendations for applying the newest pesticides, fertilizers and other materials to combat turfgrass problems. A valuable reference for diagnosing problems and determining their causes. **$54.95**

630 - TURFGRASS: SCIENCE AND CULTURE
by James Beard
Comprehensive basic text and reference source used in many leading university turf programs. Includes findings of current research compiled from more than 12,000 sources. **$54.95**

110 - TURF MANAGERS' HANDBOOK-Second Edition
by Daniel and Freeborg
ENTIRELY UPDATED. A practical guide for the turf practitioner. Chapters on grasses, growth regulators and diseases have had extensive modification. Innovations resulting from research and practice have been added to reflect the current techniques available for turf managers. **$32.95**



345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1990
Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual. **$39.95**

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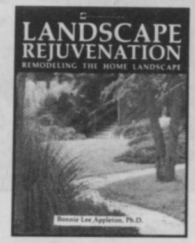
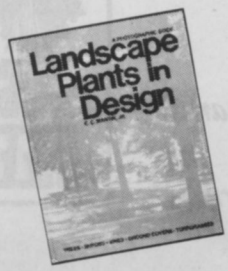
by Leroy Hannebaum
Geared for the commercial designer/salesperson, this is a one-stop guide to the landscape design process. Covers the entire highly competitive field including design analysis techniques, pointers on land forms, specialized business landscaping methods, environmental design guidelines, specifications, estimations, bids. **$54.95**



320 - LANDSCAPE REJUVENATION
By Bonnie Lee Appleton
Explains how to rejuvenate a landscape renovation. Included is information on how to make an appraisal of the landscape, how to determine landscape needs, maintenance considerations, how to execute a landscape renovation. **$15.95**

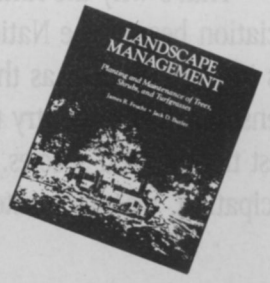
375 - RESIDENTIAL LANDSCAPES
by Gregory M. Pierceall
An excellent reference for individuals involved in the design and development of plantings and constructed features for residential sites. Illustrations and actual residential case study examples are used to communicate graphic, planning and design concepts which are the focus of this text. **$55.95**

370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS
by Leroy Hannebaum
An in-depth examination that combines technical training in landscape science with methods of accounting, business management, marketing and sales. Discusses effective methods for performing lawn installations, landscape planting and maintenance. Step-by-step accounting calculations are explained in simple terms. **$54.95**



365 - LANDSCAPE PLANTS IN DESIGN
by Edward C. Martin
An annotated black & white photographic guide to the design qualities of ornamental plants and their aesthetic and functional use in landscape designing. Over 600 trees, shrubs, vines, ground covers and turfgrasses are described in non-technical language. Over 1900 photographs. Provides a basis for selecting the best plant materials for any particular use in landscape design. Contains detailed indexes that provide quick reference to particular design qualities and growing conditions. **$68.95**

305 - LANDSCAPE MANAGEMENT
by James R. Feucht and Jack D. Butler
Planting and Maintenance of Trees, Shrubs, and Turfgrasses. Describes the basic principles of cultural management of installed landscapes. The important factors of plant growth, soils and fertilizers, improved planting techniques and new pruning techniques, integrated pest and disease management, and spray-equipment calibration and care are all featured. **$35.95**



BOOKSTORE

410 - DISEASES & PESTS OF ORNAMENTAL PLANTS
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **$39.95**

430 - DISEASES OF TREES AND SHRUBS
By Wayne Sinclain, Howard Lyon and Warren Johnson
A comprehensive pictorial survey of the diseases of, as well as the environmental damage to, forest and shade trees and woody ornamental plants in the United States and Canada. Reflects the most important developments in fungal biology and taxonomy, plant bacteriology, virology, and environmentally induced stress in plants. Summarizes information about newly discovered diseases and provides up-do-date accounts of old ones. **$52.50**

800 - THE GOLF COURSE
by Cornish and Whitten
The first book ever to give the art of golf course design its due, and golf course architects the credit and recognition they deserve. 320 pages and 150 color and black and white photographs. Traces the history and evolution of the golf course, analyzes the great courses, shows how they were designed and constructed. **$35.00**

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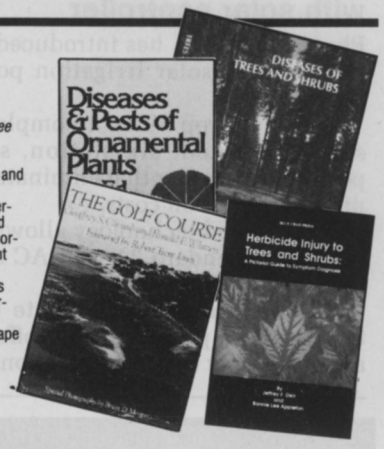
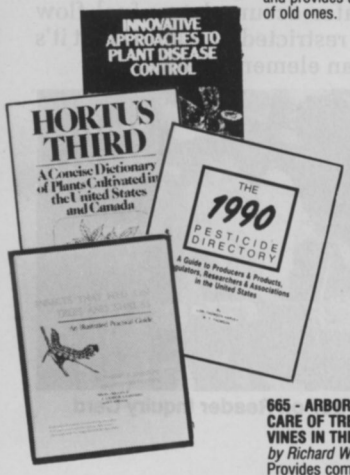
By Jeffrey F. Derr and Bonnie Lee Appleton
Describes how to diagnose herbicide damage to nursery crops and landscape ornamentals. Injury symptoms resulting from the herbicides used today are described and compared to other plant disorders to assist in diagnosing plant problems. Tables list common names, trade names, major uses and injury symptoms for the herbicides currently used in agronomic, horticultural, landscape and noncrop areas. **$24.95**




INNOVATIVE APPROACHES TO PLANT DISEASE CONTROL
HORTUS THIRD
A Concise Dictionary of Plants Cultivated in the United States and Canada
THE 1990 PESTICIDE DIRECTORY
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by G.W. Bennett, J.M. Owens, R.M. Corrigan
Fourth Edition. New chapters on fumigation, urban wildlife, special facilities, plus updated, improved chapters on pesticides, cockroaches, birds, termites, equipment, sanitation, stored product pests and more. Don't be without this updated edition.
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by Richard W. Harris
Provides comprehensive coverage of complete planting, site analysis, preparation and special planting methods, fully detailed coverage of fertilization, irrigation and pruning guidelines on preventative maintenance, repair and chemical control, how-tos of diagnosing plant problems, practical data on non-infectious disorders, diseases, insects and related pests and pest management. **$63.00**

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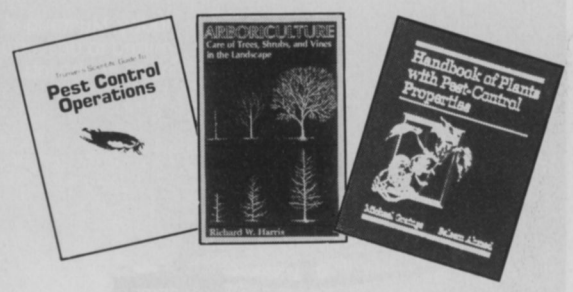
By Michael Grange and Saleem Ahmed
Provides information on approximately 2,400 plant species having pest-control properties in addition to the plant's specific common and family names, coded information is provided on such plant characteristics as life cycle, classification, and the ecological conditions suited for growth. Also lists 1,000 plants that are potential candidates for screening pest-control activity due to their poisonous nature or their ability to control human and animal diseases. **$49.95**


Pest Control Operations
ARBORICULTURE
Care of Trees, Shrubs, and Vines in the Landscape
Richard W. Harris
Handbook of Plants with Pest-Control Properties

400 - NATIVE TREES, SHRUBS, AND VINES FOR URBAN AND RURAL AMERICA
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This award-winning reference to native U.S. plants has now been expanded to include shrubs and vines. Over 250 major species are characterized by form, branching pattern, foliage, flower, fruits, habitat, soil, hardiness, susceptibility, urban tolerance and associate species. Includes unique color-coded keys that classify plant species by visual characteristics, cultural requirements and ecological relationships. **$86.00**

720 - SHRUB IDENTIFICATION
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Pictorial key to identify shrubs. Contains more than 3,500 illustrations to check specimens. Popular and botanical names are given for each shrub and handy index tabs for quick reference.
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Pictorial reference to identifying trees by checking leaves, buds, branches, fruit and bark. Like its sister publication, SHRUB IDENTIFICATION, popular and botanical names are listed with index tabs for easy reference.
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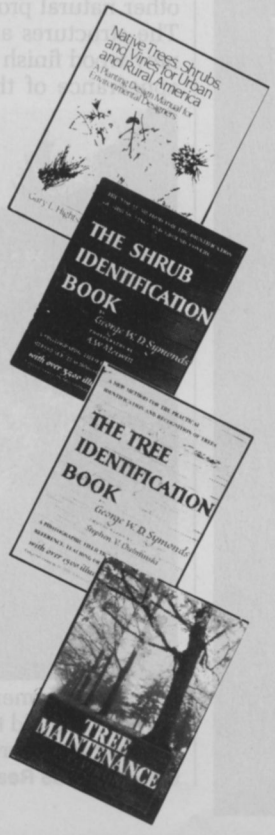
The sixth edition of this guide for anyone involved in the care and treatment of trees. Special sections on tree abnormalities, diagnosing tree troubles, non-parasitic injuries and assessing the suitability of different trees. **$45.00**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Questions? Call 218-723-9471 or 9472

LM

Manage irrigation systems with solar controller

Photocomm, Inc., has introduced the Sundrop VI, solar irrigation power system.

The Sundrop VI is a completely self- contained, six-station, solar powered controller that eliminates all utility connection costs.

Its patented technology allows operation of standard 24-volt, AC solenoid control valves.

The Sundrop VI solid-state controller is fully programmable, offering a wide variety of program options for use in any climate or application.

The controller installs quickly, and comes with all the necessary components, including the new unbreakable Duravolt Solar Module.

Circle No. 206 on Reader Inquiry Card

Filter rust, dirt out of diesel, gas fuel

GoldenRod bowl-type filters do double duty in removing rust, dirt, scale, lint and water from gasoline or diesel fuel as it leaves the tank.

Each filter has a different function. Model 495 is designed to remove microscopic particles as small as 10 microns at a 5 gpm gravity flow rate with a 24-inch head. The replaceable filter element has 366 square inches of filter surface for efficient action.

The 495 can be placed in-line to work in combination with model 496 Water-Block filter. The 496 has the same physical construction and dimensions and differs only in its special element offering excellent water absorption and 15 micron particle filtration.

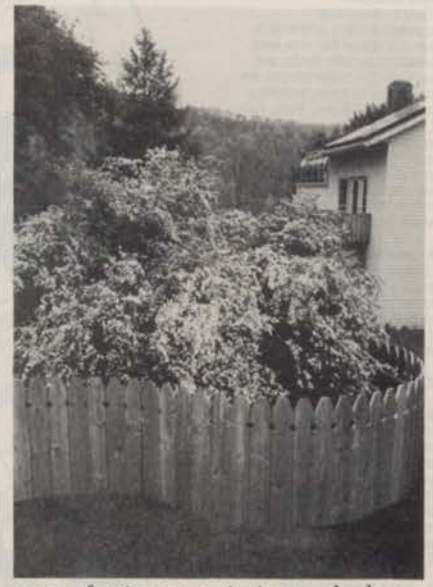
As water accumulates, fuel flow becomes restricted, signalling that it's time for an element change.

Circle No. 207 on Reader Inquiry Card

Curved woods add flair to landscape designs

Carrousel Wood Products, of Arnold, Pa., announces the invention of curved, pressure-treated wood products.

Curved fences, arched arbors, curved bridges, tree seats, curved decks, and other natural products look traditional. The structures are then coated with a new wood finish that protects the fresh appearance of the wood products for



years of enjoyment. Artisans who know hard work mold the strengh and beauty of wood into works of art.

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Mustang Today.
Just look at us now! You've known Mustang as a rugged line of skid steer loaders. But now we're also two-wheel and four-wheel drive site dumpers. We're single and double-drum vibratory rollers for surface compaction. And, we're self-propelled aerial work platforms.
Today, Mustang is the product line committed to delivering the performance you need on the job.
MUSTANG®
Run with it
CALL 1-800-562-5870 FOR THE COMPLETE MUSTANG PRODUCT STORY.
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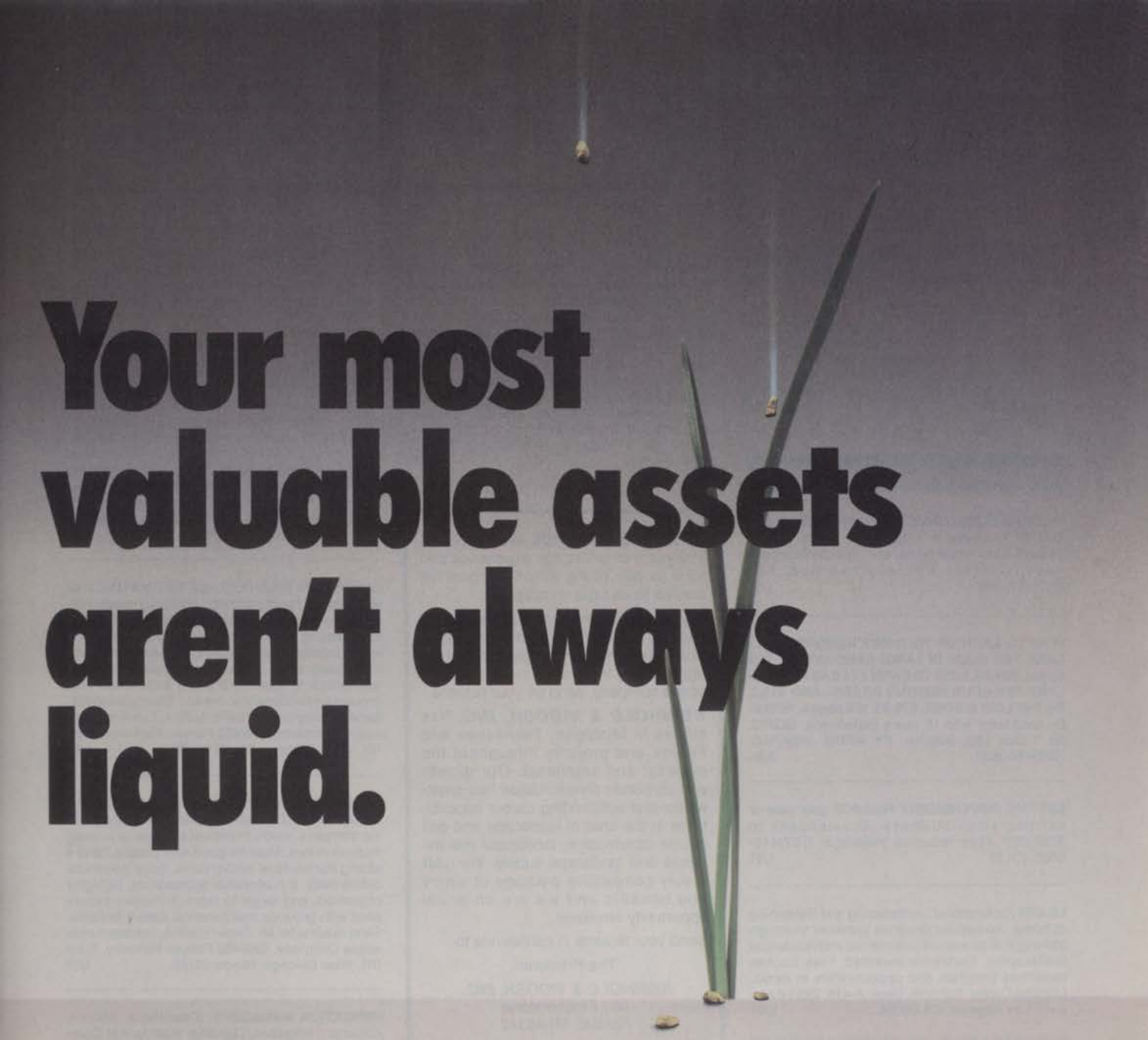

Your most valuable assets aren't always liquid.

For many weed control problems, the answer is not a solution. It's granular Team* preemergence herbicide.

Team puts your weed control where it does the most good—the weed germination zone. There it turns into a vapor and delivers a zone of protection that's very solid. So solid, it keeps out crabgrass, goosegrass and many other problem weeds all season long.

That keeps your reputation solid, too. With Team, your golf or lawn care customers will see fewer weeds—and more beautiful turfgrass.

But it's not just the tough weed control that keeps customers happy. Many of them also prefer the gentle activity of Team to turfgrass. Plus its easy, precise application. Team granules stay where you put them and won't leach out, even in heavy rainfall. And you can either apply Team by itself or on fertilizer available from leading formulators.

DowElanco™

*Trademark of DowElanco

Find out why your most valuable asset could be granular Team. Call your nearest DowElanco distributor. Or for technical assistance, call toll-free: **1-800-352-6776.**

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RATES: $1.25 per word (minimum charge, $40). Bold face words or words in all capital letters charged at $1.50 per word. Boxed or display ads: $105 per column inch-1x (one inch minimum); $100-3x; $95-6x; $90-9x; $85-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $20 to total cost of ad per issue. Send ad copy with payment to Dawn Nilsen, LANDSCAPE MANAGEMENT, 1 East First Street, Duluth, MN 55802 or call 218-723-9483. Fax Number 218-723-9615.

BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

EDUCATIONAL OPPORTUNITIES

GRAYSON COLLEGE, Denison, Texas. Two-year technical program in Golf Course and Turfgrass Management. 18-hole golf course on campus. Dormitories, placement assistance, financial aid and scholarships available. Contact: GCC, 6101 Grayson Drive, Denison, TX 75020. 214-465-6030, Extension 253. 6/91

BUSINESS OPPORTUNITIES

INTERNATIONAL INVESTOR LANDSCAPE ARCHITECT: Seeks to establish, acquire or joint venture commercial landscape maintenance business. Contact Attorney Learned, Fax (517)351-4660. 1/91

HOW TO EARN UP TO THREE HUNDRED DOLLARS PER HOUR IN LAWN RENOVATION. 200 pages. **$39.95. HOW TO EARN AT LEAST 60 DOLLARS PER HOUR MOWING GRASS...AND STILL BE THE LOW BIDDER. $29.95. 195 pages.** Written by contractor with 15 years experience. GOMC, Rt. 1 Box 19D, Sulpher, KY 40070. VISA/MC. (502)499-9031. 3/91

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LEARN Professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Certificate awarded. Free booklet describes program and opportunities in detail. Lifetime Career Schools, Dept. A-415, 2251 Barry Ave., Los Angeles, CA 90064. 9/91

WANT TO BUY OR SELL A GOLF COURSE? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517)484-7726. TF

CURB KING: Curbing machine that lays continuous concrete landscape borders. $2,695. Low investment, high returns. For information call 303-434-5337 or write P.O. Box 40567, Grand Junction, CO 81504. 3/91

HELP WANTED

SALE-DESIGN-ESTIMATING a large high quality service oriented site construction corp. is looking for a highly motivated individual to join our team. Must have construction background, excellent communication skills, and a professional manner and appearance. Benefits and pay are commensurate with ability and experience. Send resume to Decorative Paving Co., 33 W. 518 Fabyan Parkway, West Chicago, IL 60185. 3/91

LANDSCAPE MAINTENANCE TRAINEE: Residential design/build landscape contractor is seeking a career-minded individual to become part of our landscape management team. Responsibilities include: maintenance of our landscape installations, warranty service and customer service. Knowledge of plant material helpful. Experience and/or education in horticulture or landscape maintenance helpful, but not necessary. Little or no mowing. 4-5 day work week, good pay with benefits. Send resume to or call: Garden Gate Landscaping, Inc., 821 Norwood Road, Silver Spring, Maryland 20905. (301)924-4131. 1/91

REINHOLD & VIDOSH, INC. represent 100 years of landscape experience and rank as one of the nation's largest full service landscape companies.

If you are a landscape professional seeking a career opportunity and would like to become an integral part of an aggressive, innovative national landscape company, send us your resume.

REINHOLD & VIDOSH, INC. has offices in Michigan, Tennessee and Florida and projects throughout the midwest and southeast. Our growth and corporate diversification has created several outstanding career opportunities in the area of landscape and golf course construction, landscape maintenance and landscape supply. We offer a very competitive package of salary and benefits and we are an equal opportunity employer.

Send your resume in confidence to:

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PROBLEM MANAGEMENT

Preventing root rot

Problem: *What can be done to prevent or cure oak root rot? (California)*

Solution: I believe you are referring to oak root rot, known as "shoestring" root rot caused by *Armillaria sp.* This fungal disease is reportedly severe in California on oaks on properties maintained with heavy irrigation and soil compaction. This disease is associated with stressed and weakened trees in compacted soils receiving heavy irrigation.

Oaks in your area are also susceptible to root rot diseases caused by *Phytophthora sp.* Since you mentioned oak root rot, we will discuss the shoestring root rot caused by *Armillaria sp.*

Affected trees may show various degrees of decline with thin crown and twig dieback. To detect the problem, tap the trunk with a soft mallet. If you hear a hollow sound indicating the bark has pulled away from the wood, bark trace the area and look for fungal bodies or mycelial structures called "rhizomorphs." In addition to this, at the base of affected trees, honey-colored mushrooms can be found as the disease progresses.

There is not much that can be done to save the tree. If the rhizomorph has not spread too far, bark trace and open up the diseased area near the ground level to air dry, and put the soil back prior to winter. This might be helpful in promoting callus growth. This disease is soil-borne, meaning the fungus that causes it is in the soil.

Provide proper fertilizing, watering and pest management as needed to help improve the plant's vitality. Minimize the stress factor(s), monitor watering practices, and aerify the compacted soil where feasible.

The cause of oak decline

Problem: *A large number of oaks show various stages of decline and some are now dying. Is there some major disease that is killing these trees? What can be done to save them? (Michigan)*

Solution: Although we had plenty of rain last year, we are experiencing a significant number of landscape plants dying. In some situations, plants with shallow root systems can be severely injured due to excess moisture around the root system.

Yet many dying trees, such as established oaks, may be the victims of stress from the 1988 drought and subsequent attack from secondary pests and disease. We observed a large number of declining oaks, maples and elms last summer that we attributed to these factors.

In many areas, the effect of drought was severe enough to cause stress and predispose oaks to borers, particularly two-lined chestnut borer, cankers such as hypoxylon canker, twig blight caused by *Diplodia*, and Armillaria root rot (shoestring root rot). These insect and disease agents gradually establish on stressed and weakened trees.

Although trees look very large, most of the functional roots are in the top 18 inches of the soil. The absorbing roots, which are the fine hairlike roots, are near the surface and can be injured or killed during drought. This affects water and nutrient uptake to the crown, causing dieback. These weakened trees will be predisposed to insect and disease activity two to three years after injury, which contributes to further injury and even death, That is what you may be experiencing at this time.

Other factors such as tree age in relation to site index, soil disturbance and root injury, and species of oak (generally red oaks are more susceptible to drought stress, although it is not limited to this species) can contribute to the dying of drought stressed trees.

In some situations, oak decline has the appearance of oak wilt disease. Oak wilt symptoms are usually severe during summer with premature defoliation of leaves with various degrees of discoloration. Defoliation is usually severe at the top of the crown. A brownish discoloration can be found in the vascular tissue of branches. For positive confirmation, a laboratory culturing of the wilt-causing fungi is needed. Generally, oak wilt occurs in a small number of plants at random places, like the problem of dying associated with drought.

Symptoms of oak decline and mortality due to drought usually peak in late summer. The mortality affects a number of plants in large areas. As compared to oak wilt disease, the drought stressed plant will have a sparse crown with small leaves and twig dieback, which will lead to death in future years.

Provide selective pruning, proper watering, fertilizing, mulching and pest management as needed to help improve plant vitality. These plant health care practices will help the drought-stressed trees.

Preventing poison ivy spread

Problem: *Can poison ivy be spread by allowing a part of the body that is not affected to come in contact with one that is infected? Also, can consuming poison ivy leaves cause the mouth and digestive system to become infected? (Michigan)*

Solution: According to the regional Poison Control Center in Akron, Ohio, "poison ivy cannot be spread by allowing a part of the body that is not affected to come in contact with one one that is affected—unless the oil from the plant is present on the skin and is transferred. If accidentally contacted, affected body parts should be thoroughly washed with soap and water. The oozing from blisters on skin will not spread the problem to unaffected areas. Ingestion of the foliage can cause vomiting and itching internally." **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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